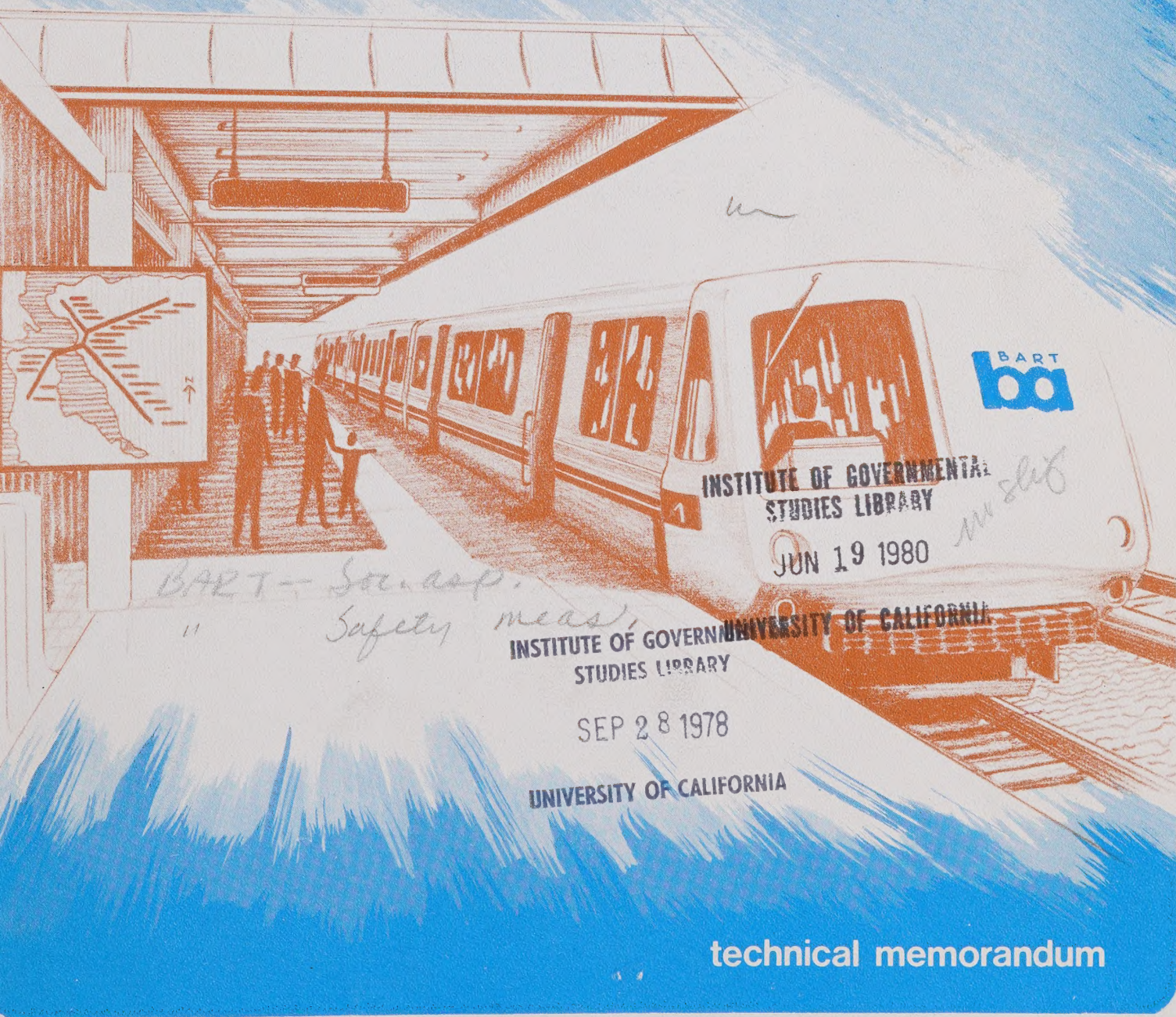


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bart impact program

SOCIAL IMPACTS OF BART ON BAY AREA FAMILIES AND LIFE STYLES



The BART Impact Program is a comprehensive, policy-oriented study and evaluation of the impacts of the San Francisco Bay Area's new rapid transit system (BART).

The program is being conducted by the Metropolitan Transportation Commission, a nine-county regional agency established by state law in 1970.

The program is financed by the U. S. Department of Transportation, the U. S. Department of Housing and Urban Development, and the California Department of Transportation. Management of the Federally funded portion of the program is vested in the U. S. Department of Transportation.

The BART Impact Program covers the entire range of potential rapid transit impacts, including impacts on traffic flow, travel behavior, land use and urban development, the environment, the regional economy, social institutions and life styles, and public policy. The incidence of these impacts on population groups, local areas, and economic sectors will be measured and analyzed. Finally, the findings will be interpreted with regard to their implications for the planning of transportation and urban development in the Bay Area and other metropolitan areas.

7900060

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BART IMPACT PROGRAM
SOCIAL IMPACTS OF BART
ON BAY AREA FAMILIES
AND LIFESTYLES



NOVEMBER 1977

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PREPARED FOR
U.S. DEPARTMENT OF TRANSPORTATION

AND
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

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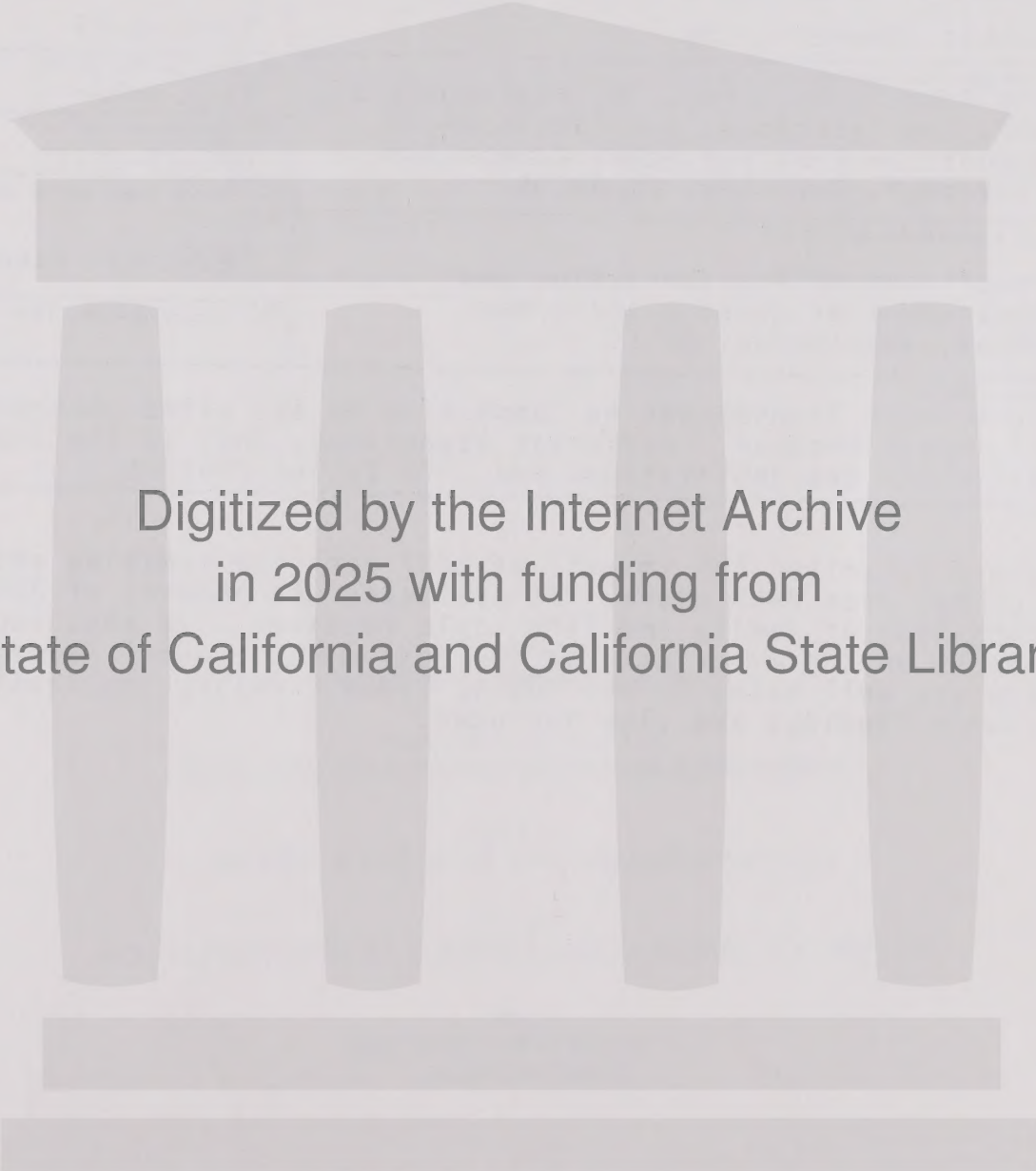
FOR THE
U.S. DEPARTMENT OF THE TRANSPORTATION

AND THE
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

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16. Abstract This report describes the impacts of BART upon the families and life styles of Bay Area BART users. It evaluates the impacts of BART upon nine dimensions of family and life style routines. It also reports BART impacts on the experience of the region and riders' perceptions of safety and well being in the Public Space. Policy implications of the research findings are also included.			
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Lastly, this work would not have been possible without the conscientious participation of our user panel members.

PREFACE

The BART Impact Program

The BART Impact Program is a comprehensive policy oriented study of BART's impacts upon different aspects of the BART Service Region. The program is concerned with reporting and evaluating the impacts of BART upon the quality of the environment, land use patterns, travel behavior, public policy, social institutions and life styles of BART users and the economics of the service region.

Evaluation of the impacts of BART will assist local, regional, and federal officials and planners in evaluating the effects of new rail rapid transportation systems upon the life and activities of a region. A factual baseline will serve to guide further transit development within the region and assist others outside the region in determining the positive and negative impacts of a new rail system. Guidelines for maximizing the benefits of development and minimizing negative effects should be generated by the program research activities.

The ILS Project

The Institutions and Life Styles Project describes the direct and indirect impacts of BART upon life styles and key social institutions within the Bay Area. It describes BART impacts upon shopping, work routines, recreation and leisure activities, visiting with family and friends, the scheduling of activities, public transit use, styles of automobile use, and ideas and beliefs about transportation and the environment. The project also aimed at determining impacts of BART upon the organization, administrative policies, and functioning of health care institutions, institutions of higher education, and local political institutions, and describing BART's meanings for the life styles of their clientele groups.

This report is an interim document, presenting findings on the impacts of interim BART service upon the life styles of BART users. It will be followed by a final report incorporating these and subsequent findings of field research into the impacts of BART upon life styles in three primary types of community settings.

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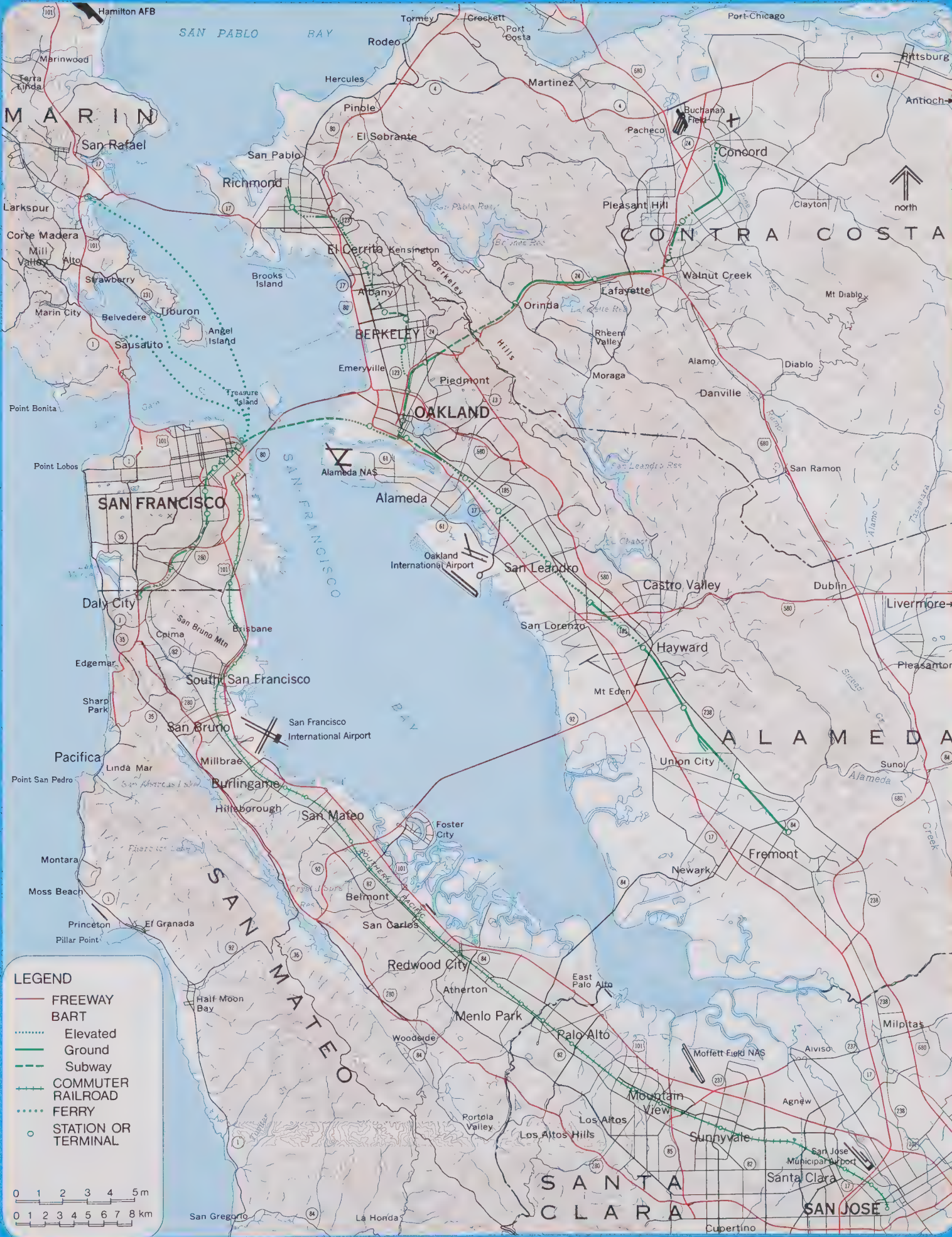
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- LEGEND**
- FREEWAY
 - BART
 - Elevated
 - Ground
 - - - Subway
 - + - - COMMUTER RAILROAD
 - FERRY
 - STATION OR TERMINAL

0 1 2 3 4 5 m
0 1 2 3 4 5 6 7 8 km

SAN FRANCISCO BAY REGION CENTRAL AREA

BART: The Bay Area Rapid Transit System

Length: The 71-mile system includes 20 miles of subway, 24 miles on elevated structures and 27 miles at ground level. The subway sections are in San Francisco, Berkeley, downtown Oakland, the Berkeley Hills Tunnel and the Transbay Tube.

Stations: The 34 stations include 13 elevated, 14 subway and 7 at ground level. They are spaced at an average distance of 2.1 miles: stations in the downtowns are less than one-half mile apart while those in suburban areas are two to four miles apart. Parking lots at 23 stations have a total of 20,200 spaces. There is a fee (25 cents) at only one of the parking lots. BART and local agencies provide bus service to all stations.

Trains: Trains are from 3 to 10 cars long. Each car is 70 feet long and has 72 seats. Top speed in normal operations is 70 mph with an average speed of 36 mph including station stops. All trains stop at all stations on the route.

Automation: Trains are automatically controlled by the central computer at BART headquarters. A train operator on board each train can override automatic controls in an emergency.

Magnetically encoded tickets with values up to \$20 are issued by vending machines. Automated fare gates at each station compute the appropriate fare and deduct it from the ticket value. At least one agent is present at each station to assist patrons.

Fares: Fares range from 25 cents to \$1.45, depending upon trip length. Discount fares are available to the physically handicapped, children 12 and under, and persons 65 and over.

Service: BART serves the counties of Alameda, Contra Costa and San Francisco, which have a combined population of 2.4 million. The system was opened in five stages, from September, 1972, to September, 1974. The last section to open was the Transbay Tube linking Oakland and the East Bay with San Francisco and the West Bay.

Routes are identified by the terminal stations: Daly City in the West Bay, Richmond, Concord and Fremont in the East Bay. Trains operate from 6:00 a.m. to midnight on weekdays, every 12 minutes during the daytime on three routes: Concord-Daly City, Fremont-Daly City, Richmond-Fremont. This results in 6-minute train frequencies in San Francisco, downtown Oakland and the Fremont line where routes converge. In the evening, trains are dispatched every 20 minutes on only the Richmond-Fremont and Concord-Daly City routes. Service is provided on Saturdays from 9 a.m. to midnight at 15-minute intervals. Future service will include a Richmond-Daly City route and Sunday service. Trains will operate every six minutes on all routes during the peak periods of travel.

Patronage: Approximately 142,000 one-way trips are made each day. Approximately 200,000 daily one-way trips are anticipated under full service conditions.

Cost: BART construction and equipment cost \$1.6 billion, financed primarily from local funds: \$942 million from bonds being repaid by the property and sales taxes in three counties, \$176 million from toll revenues of transbay bridges, \$315 million from federal grants and \$186 million from interest earnings and other sources.

March 1978

SUMMARY

Life Styles and Family Relationships

The Family and Life Styles Component is concerned with the direct and indirect impacts of BART, as a new rail rapid transit system, upon life styles and family relationships of its users. When looking at life styles we are principally concerned with the ways that different aggregates of people consume their time and money resources, and with what meanings these consumption patterns hold for their life routines. The study focuses specifically upon the ways that BART use influences changes in activities, scheduling of activities, and the complementarity of household members' routines. These effects include BART impacts on the pace, ambiance, comfort, ideas, imagery, and sense of well being of its users. BART impacts upon the life styles of different population sub-groups are organized in terms of nine dimensions of routine life activities:

1. Consumption and consumption style
2. Work and work related routines
3. Selection of residence location
4. Recreational and leisure activities and experience of the public space
5. Visiting with family and friends
6. Style and scheduling of routines including the complementary scheduling of routines among family members
7. The experience and use of public transit
8. Automobile access and style of automobile use
9. Ideational-Normative Style -- Changes in people's beliefs and experience of transit, and the relationship between sentiments on energy conservation and ecology and public transit use

Methodology

Research activities focused upon intensive case studies of the population of interest: BART riders. A case study panel was employed for in-depth exploratory investigation of BART impacts on the life routines and families of its users. The case study panel of 75 households of BART users was deliberately selected from among 450 BART riders who had been identified through short field interviews on BART trains or within BART

stations. Family Panel members included a representative selection of single as well as multiple person households. In addition, respondents were included to be representative of the sex, ethnic composition, and differing geographic locations of BART users. There was, however, some over-selection of multiple purpose BART users, that is, persons who use BART for the work commute as well as some other purpose. Panel members were administered extensive in-depth interviews by trained researcher-ethnographers. The research was focused around determination of the actual and potential impacts of BART upon many facets of individual and family routines. Panel interviews were augmented by field observation, field interviews with recreational users, data on the composition and trip purposes of BART riders, and findings from regional surveys of transit consumers in the BART counties.

In addition, there were two series of Field Youth Contact Interviews. These interviews were conducted with 400 youthful riders of BART between the ages of 10 and 19. An observational census by age was conducted to determine the extent of youthful ridership on the system at six East Bay locations during the off-peak 2:00 to 4:00 p.m. time period of maximum youthful BART use. Phone recontact interviews were conducted with fifty of the original youth interviewed in the field. The recontact interviews sought to identify changes in patterns of BART use and the effects of BART use on routines of youth and their family relationships. Phone contact interviews with 30 of the parents of youthful BART riders were also conducted to determine the level of parental BART use, parental attitudes toward BART, and parental conceptions of the effects of BART on the ordering of youthful life style routines and the relationship of youth to their family units.

The Economy of Alternatives

Research activities make clear that BART impacts upon the life routines of its users is differentially stratified, in part, according to the economy of alternatives of the family households. Households with limited economic resources and no automobile access were more likely to make adjustments in the ordering and experience of their life routines as a result of BART impacts. Car owners and persons with more extensive economic resources were more thoroughly insulated from BART impacts on their routine activities. Their greater access to automobile travel and their greater economic resources created greater degrees of freedom in their economics of travel related choices. BART, as one facet of their economics of choice had more limited meanings for the conduct of their lives.

BART and The Generational Character of Life Styles

Life styles have a generational character. They become salient and undergo change with different periods of social experience. BART as one facet of the social sphere has different meanings and is differentially chosen as a transit mode by different generations. BART is disproportionately a system

of the youthful. While the district Bay Area population of persons between the ages of 14 and 34 is 43%, BART ridership includes 62% within this age group. Many older residents of the area (55 and over) are regular users of public transit. But, including travellers with senior citizen discount tickets, older persons still make up a small share of BART consumers. Even when we control for the structural characteristics of BART and the bus by looking at longer trips to the CBD's of Oakland, San Francisco, and Berkeley we find a selection of BART even where car access and economic resources for transit are not in question. Among the middle aged grouping from 35-55 the car captures the biggest share of their routine travel. Relative to the younger and older population groups this grouping which came of age with the democratization of car ownership and the creation of the freeway and highway systems is less likely to use either bus or BART. Life styles of generations influence the decision to choose BART, and once chosen, BART has different meanings for the life styles of users at different points in the life cycle. Also, we may expect the socialization of new generations in rail rapid transit use to have tangible future impact upon Bay Area families and their life styles.

BART Adult Life Style and Family Impacts: Consumption and Styles of Consumption

BART has limited impact upon the location of consumption and the nature of consumption routines. It results in a small increase in shopping trips to the central business districts of San Francisco and Oakland. These trips may include special types of outings with friends or specialized shopping for goods not available in local stores. Both these types of trips represent an incremental change over pre-BART use routines. BART impact on shopping is limited by the lack of weekend service and the fact that most consumers do their routine shopping at supermarkets and shopping centers close to home. However, BART does influence the taking of shopping excursions at lunch time or after work among some of its work commuters. These trips are used as a break from ordinary routines and appear to be stimulated by a sense of freedom of movement inspired by BART. Some transit dependent panel members also report rescheduling their former weekend shopping trips around BART's weekday service schedule to enable a use of BART instead of the bus.

Work and Work Routines

BART appears to have the most consistent impacts upon the work routines and work related experience of regular commuters. BART changes the timing and scheduling of work trips. Partly due to BART's unreliability, most regular commuters are forced to move their morning departures to work back from 10 to 45 minutes, in order to assure arriving at work on time. Other workers with more flexible work schedules report changing

the hours of their work to avoid commuting during the rush hour period. Commuters experience initially a sense of frustration and occasional anger and loss of faith in the quality of BART service. However, researchers found that over time this discontent turns for most to a sense of acquiescence and surrender to the un-predictability of BART. Other commuters, particularly those with fixed work schedules report changing to bus travel in the morning or reverting to use of the bus or car for all work travel. However, this is a smaller group. The greater part of the panel appear to experience a change in their relationship to the time and pace of their work commute through BART travel. They report looking forward to the period of waiting and riding as an opportunity for reading novels or newspapers and magazines. Over half of the regular commuters report that BART leaves them more relaxed when they return home. They compare it favorably to the pains of rush hour auto travel, and report it variously as a clearing-out space, a time to think things through, or a period of relaxation in transition between the home and work worlds. About 1/8 of the regular work commuters report doing work while in transit. The work consists of ordering their schedules for the day's activities or reading through correspondence and professional journals. For a small segment of the panel members BART seems to encourage greater side trips for visiting or going out in connection with the trip from work to home. These trips are most prevalent among single persons and the transit dependent members of the panel.

Residence Selection

BART influences the process of selection of the location of residence for 15% of the case Panel. BART does not create but contributes to a pattern of city work routines and new suburban-country style residential modes. This is the same pattern of choice created by highway and suburban housing development of the 50's and 60's but with a different mode. The choice of public transit as a reason for housing location represents a real shift in the orientation toward transit as a basis for organization of family routines. A related feature of BART's impact on selection of suburban residences is the perception of BART as an element responsible for the increase in the value of suburban residential modes in close proximity to BART stations.

Recreational and Leisure Activities

BART appears to have limited present impact but larger potential impacts under Full Service conditions for the organization and taking of recreational and leisure trips. Recreational trips are the most frequent reasons for use of BART among the regional population. But most of this population are very infrequent users of BART. Consequently, on any particular day recreational and leisure trips are a small part (less than 10%) of the reported trip purposes of BART journeys. The one exception to this pattern is travel to the Oakland Coliseum, home of the Oakland Athletics and the Oakland Raiders.

BART is selected for travel to the Coliseum, largely because of the problems of parking and leaving the parking area. Panel members do report taking Coliseum trips on BART that otherwise would not have been taken. In addition, BART appears to influence the taking of occasional non-specific recreational trips to the Central Business Districts of Oakland and San Francisco. These trips often combine walking around, with shopping excursions, going out to eat, or visiting with friends. Persons report taking these trips on BART who never would have taken them on the bus.

But as with shopping trips, the weekend period is the usual time frame for recreational activities. In addition, the difficulties of inter-modal trips, particularly with poor bus or feeder connections at origin or destination points lead to a de-selection of BART among most but the transit dependent members of the panel. Levels of patronage under some BART promotions, particularly with the Labor Day reduced fare offer, are exceptions to this trend. Travellers for both Labor Day and the Ringling Brothers Circus promotion were predominantly travelling in groups. Ordinary travel on BART (over 85%) is primarily by persons travelling alone. The reduced fare on Labor Day (25¢) was reported in field interviews as partly responsible for using the system. The response to these promotions and the present level of BART use to the Coliseum suggest that recreation and leisure impacts might be much greater under weekend service conditions. Further, the possible introduction of reduced weekend or evening fares would appear to stimulate further this life style area of BART use, with the additional effect of the substitution of BART for some family trips ordinarily taken by car.

Visiting with Family and Friends

BART appears to have very limited impact upon patterns of visiting with family and friends among most panel members. Among automobile owners, car travel is the preferred and usual mode for visiting. Further, many panel members do not report having close family ties in the region that they might visit on BART. However, family visiting appears to be a more central activity among ethnic families in the Panel. For those ethnic family members who lack car access, BART encourages the taking of family visiting trips and the frequency of these visits.

BART also has clear impacts upon the family visiting of its youthful users. Of our spring panel of youthful BART users, 6% report using BART to visit their separated parents. Of all youth trips in both the Spring and Summer field interviews .14% were trips to visit family or relatives. BART changes the frequency and ease of trips by youth to visit family and extended family, particularly grandparents. Parental Contact Interviews suggest that these trips would be less frequent and more difficult without BART. Additionally, parents of youthful travellers report having free time created by being freed through BART from the need to chauffeur their children.

Scheduling and Complementary Scheduling of Routines

BART has limited impact upon the scheduling of household routines. For car owners it seems to affect only the scheduling of work and work related trips. This has limited impacts other than those reported in the work related findings, with the exception of its demands on single car families where both adult members could benefit from use of the car. In these cases, scheduling must occur and often the non-working wife must drop off and pick up her husband at the BART station. However, one car families also experience an increase in freedom of activities through BART facilitated car access for family members remaining at home. The other observed impact in this area was the re-scheduling of visiting, shopping, and family visits among some transit dependent members of the Family Panel in order to take advantage of BART service when it's presently available.

Automobile Access and Automobile Use

BART has very limited impact on the style and frequency of car use. Generally, auto owners report that BART does not meet the needs of routine trips for shopping or more irregular trips for visiting or recreation. The car is considered more convenient, faster, and is associated with more control over scheduling and greater convenience than available combinations of BART and buses. However, car owners do assert that changes in feeder availability would result in some alteration of their patterns of car use. In a good portion of the cases, respondents view BART as competitive with the comfort of the car but experience it as lacking in necessary service characteristics. A small portion of the regular commuters in the panel report savings due to decreased costs of automobile operation, ability to function with one rather than two automobiles, or savings due to deferral of replacement of an existing car.

Experience of and Use of Public Transit

BART represents a major transformation in the experience by panel members of the non-access characteristics of public transit. BART changes the definition of public transit from a shabby, second-rate, fearful, odor filled, and socially awkward setting to a comfortable and pleasing space. BART is perceived, particularly by car owners and usual car travellers, as more comfortable, having a better class of patrons, physically and socially safer, and less filled with odors than the bus. Auto users report taking BART who would prefer not to use the bus. Transit dependent persons also report pleasant experiences of the greater comfort and sense of physical well-being when travelling on BART relative to their regular experiences of bus travel. The only exception to this pattern, is the report by some 1/7 of the panel members of BART as being too sterile, automated, space age, cold, inhumane, or an "uptight" environment. BART is perceived favorably by most panel members for its sense of

refinement and quiet comforts. But these same characteristics seem to color an experience of BART and its present patronage as cold and lacking in spirit and human vitality for a smaller group of users.

Ideational-Normative

A large segment of regular BART users report concerns with the region's ecology or with conservation of resources. They feel that they are encouraged to use BART because of their commitment to these values. However, patrons also report a conflict between the routine concerns of their private interests and their commitment to these values. In general, it appears that ecological values may influence selection of BART use but they do not by themselves transform the structuring of routines around BART availability. BART users tend to regard BART as a modern, attractive version of public transit facilities. But particularly transit dependent persons assert that it is not "real rapid transit" because of its unreliability and its lack of late evening and weekend service. Opinions of lesser strength are offered about BART's inadequacies as public transit because of its limited feeder services. Car owners insist that public transit must be very convenient to get them out of their cars.

I. INTRODUCTION

BART represents the unusual, the public expenditure of large sums toward the first regional-scale rail rapid transit system to open in the United States in over fifty years. In a period of automobile dependence and growing shortages of fuels, other areas considering new transportation developments may look to the Bay Area for models of the meanings a new regional transit system can have for people's life routines.

The study of life styles of transportation consumers in the Bay Area provides us with a prototype for understanding consumer responses to new rail rapid transit. It helps to provide an understanding of consumer travel behavior and transportation attitudes as rooted in the routines of particular life styles. A study of life style impacts provides a baseline for:

1. Preliminary assessment of the social meanings of new rail rapid transit development;
2. Determination of the likely trends of system social impacts under conditions of extended service or modifications in transit operation policies;
3. A guide for planners and decision-makers in other regional settings seeking to tailor transit development to the needs and preferences of transit-dependent and car-dependent market segments.

Car Dependence Within the Region

The private resources committed to auto transportation and public commitment to the automobile as the preferred transportation mode are very high. The average household spends about 15% of its personal income on car ownership and operation. (Hertz Corporation, 1976). Within the three-county BART area, auto transportation is the dominant mode, but auto use and access varies within different areas of the region and according to the financial resources of the residents.

Table 1

Percent of Household Members 16 & Over
With Direct Motor Vehicle Access in 1971

<u>Income</u>	<u>San Francisco</u>	<u>East Bay BART Counties</u>
All Households	50%	74%
Less than \$10,000	40%	63%
Over \$10,000	72% ¹	83%

Income figures are based upon family or personal income. All figures are estimates.²

Distinctive Regional Characteristics

The San Francisco Bay Area of Northern California is a population center with a geographically dispersed population, with a three BART county population of 2.4 million and no cities with over one million people. Although it is a center of Western banking and financial services, proximate to the Santa Clara Valley home of the semi-conductor industry, and hub for agricultural and port related warehousing and distribution, the Bay Area has been in a period of relative decline in its manufacturing and productive industries. Service, management, and related activities provide a growing share of productive employment in the region. Thus, the San Francisco Bay Area lacks the concentrated population density and manufacturing base of other urban centers with which it is often compared. Cities currently experiencing BART type transportation development, Atlanta and Washington, D.C. for example, both have larger population concentrations, and in the case of Atlanta, a growing role in industrial production and distribution for its regional area.

The resources of the Bay Area are primarily its physical beauty, its moderate climate, its place at the confluence of major watersheds, and its historical status as a center of commerce and cultural activity. San Francisco's number one industry is tourism and tourist related services.

BART: Its Present Service Characteristics and Life Style Implications

BART's present ridership travels primarily to destinations in the Central Business Districts of Oakland, San Francisco, and Berkeley.

¹The largest percentage of BART users falls in the over \$10,000 income category (1976 PPS)

² Source: Foley (1972)

Two-thirds of the present system passengers are travelling to the employment and educational centers served by seven stations in these central business areas. Some 70% of all BART trips are taken for work, work-related or educational purposes, and most riders on the system are regular users (three or more times a week). Although the Bay Area is a tourism center, official estimates of recreational and tourist travel on the BART system are relatively low.

In most major metropolitan areas, central city transit systems have been built around the cultural and other public institutions of the central area, the activity centers of government, business, and daily commerce. Facing the problems of decay within the central metropolitan areas, and the separation of the suburban residential communities from the central employment, recreation, and government centers, BART is an attempt (among its other purposes) to link up the suburban communities with the Central Metropolitan Districts.

In addition to providing an arterial connection between satellite communities and Central Business Districts, BART is a new structural mode of transit which contributes to the potential reorganization of social patterns. Social roles are patterned ways of living in particular social settings. BART can effect subtle changes in the way people organize and view their daily routines. It holds the potential under full service, progressively scarcer energy resources, and improved inter-modal connections, for more profound impacts on the way people organize their routines.

The responses of riders and potential riders to BART and its effect on their routines is influenced by the fact that it is not presently a consistently reliable system. Train equipment failures result in unplanned delays and a need to offload passengers in mid-trip, recently averaging 6.4 occasions per day. Car availability problems result in unplanned deviations from the scheduled 12-minute headways (6-minute headways on the downtown Oakland to downtown San Francisco line segment). Informal interviews with BART patrons by the BART Impact Program Environment Project indicate that train delays and the lack of information provided on them is one of the principal sources of dissatisfaction among patrons.¹ BART has begun providing patrons more information over train and station loudspeakers concerning delays and is showing improvement in service reliability.²

Area Specificity and the Making of Transportation Related Routines

Transportation is a consumption good which varies in its character with the location of consumers and the availability of other transit alternatives. BART constitutes a connecting link among a variety of central urban and suburban communities. The way people use BART varies with the contextual settings and public transportation alternatives of these different communities. Within the central business district areas of San Francisco, Oakland, and Berkeley, the stations have no parking lots. Ready access from home origins is primarily by bus, in a car driven by another, by bicycle or on foot. The method of access to origin BART stations provides a picture of BART characteristics as "mass" transit at different points along the BART line.

¹ Environmental Impacts of BART; The User's Experience (DOT-BIP-TM 23-4-77)

² Appendix A

Percent Using Bus or Walking as Access Mode to Origin Stations

<u>Urban Settings</u>		<u>Suburban Settings</u>	
<u>Central San Francisco</u>			
Montgomery	79.1	All Concord Line	24.8
Powell Street	86.6	All Fremont Line	24.9
Civic Center	86.7	ALL SYSTEM	35.5
<u>San Francisco (Outer Districts)</u>			
16th/Mission St.	80.7		
24th/Mission St.	84.1		
Glen Park	50.1		
<u>Central Berkeley</u>			
	78.5		
<u>Central Oakland</u>			
12th Street	88.0		
19th Street	71.8		

These percentages are for A.M. peak travel time. However, off-peak BART use reveals a very different pattern of access to the stations. While access modes remain relatively constant at the walk/public transit stations above, bus and walking access go up considerably for the system as a whole with the relatively more transit dependent off-peak users.

<u>All Stations</u>		
<u>Method of Access</u>	<u>Off-Peak</u>	<u>Peak</u>
Walk	38.8	17.9
Bus	22.4	17.6
Total	61.2	35.5

The chosen origin access modes to BART reveal differences in system characteristics between urban and suburban locations. However, when we recognize that 46% of all travellers ride during the off-peak period we see that BART functions to a large degree as regular public transit during the off-peak time frame at all locations along the BART line. BART's suburban-commuter line function is much stronger during the peak period of travel.

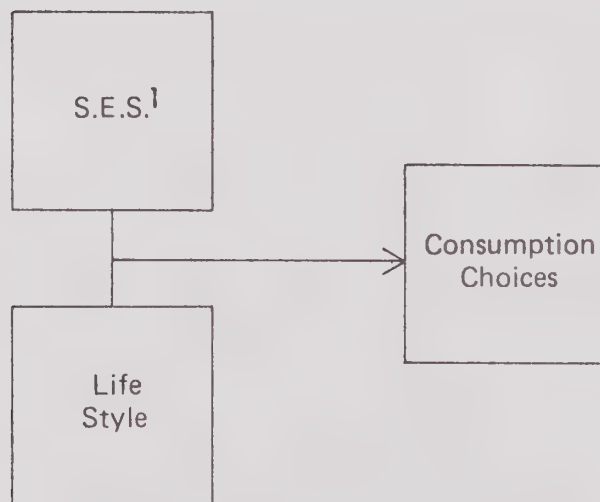
In the suburban peripheries of the BART system BART becomes part of a world oriented around car travel. Public transit routes are limited in most cases to BART feeders, and downtown shuttles, and limited Greyhound service in Contra Costa County. In all traffic zones the automobile is dominant. However, in the urbanized areas of San Francisco, Oakland, and Berkeley the automobile shares dominance with more extensive bus and trolley networks. Within the suburban zone, BART plus feeders represents a new trend of public transit alternatives to the automobile.

II. THE THEORETICAL BASE

Applying the Concept of Life Style to the Study of BART's Life Style Impacts

The concept of "life style" was first applied to the study of man and society in the work of Max Weber, who used it in discussing the effect of status groups upon the consumption activities of the new bureaucratic class (Gerth and Mills, 1958). Style of life was treated by Weber as the distinctive way in which persons who share similar opportunities (class) in relation to the economic sphere of production engage in distinctive forms of consumption. From this perspective life style interacts with social class position to determine distinctive ways of living. This conceptual approach may be viewed diagrammatically as:

FIGURE 1 - LIFE STYLE AND CONSUMPTION CHOICES



¹ Socio-economic stratum

Applying The Concept of Life Style to Transportation Research

There has been an increasing interest in recent years among transportation planners in studying the relationship between different types of transportation alternatives and a variety of social factors. This interest arises from an interest in tailoring new transportation development to the particular travel needs of a variety of sub-populations. The concerns with meeting the travel needs of the transit dependent, encouraging a change to public transit among automobile users, and employing transportation development as one facet of urban redevelopment to stimulate the social and economic life of metropolitan regions have all contributed to a new consciousness and concern with the social meanings of new transportation developments.

These recent inquiries into the social aspects of transportation system impacts fall within three related areas of interest:

1. What social and psychological factors influence the decision to use different types of transportation modes?
2. What are the effects of different types of transportation systems on the social aspects of consumption, selection of residence locations, work routines, and cultural and recreational activities?
3. What are the impacts of different types of transportation systems on nominally non-quantifiable facets of everyday life; visiting, social interaction, comfort, freedom of movement, ranges of experience, and equal opportunity for access to different parts of a service region?

The concept of life style is a flexible and inclusive concept for examining these three types of social facets of transportation system impacts. Life style in many respects deals with the constituent elements of a culture or sub-culture. However, life style is a more flexible and open-ended construct. Persons may share elements of a life style without sharing the whole system of social values, meanings, and role expectations which are integral elements of a culture or sub-culture.

In periods of rapid social change, such as our own, the concept of life style is a sensitive construct for conceptualizing the interaction between new social and physical developments and the organization of peoples' daily routines. For our purposes we have chosen to conceptualize life style as the distinctive ways that persons consume their scarce resources of money and time including the meanings which these activities hold for social actors. This approach combines the approach to life style which began with Weber with more contemporary approaches

which focus upon time allocation or patterning of activities in daily routines (Havighurst, 1957; Warner, 1963; Handel and Rainwater, 1964; Chapin and Hightower, 1966).

The emphasis on consumption of time and money provides a life style construct which is most useful for transportation impact analysis where primary interest centers on time and cost elements of mode choice and the meanings of different modes for consumption related activities of shopping, residence location choices, work, and recreation.

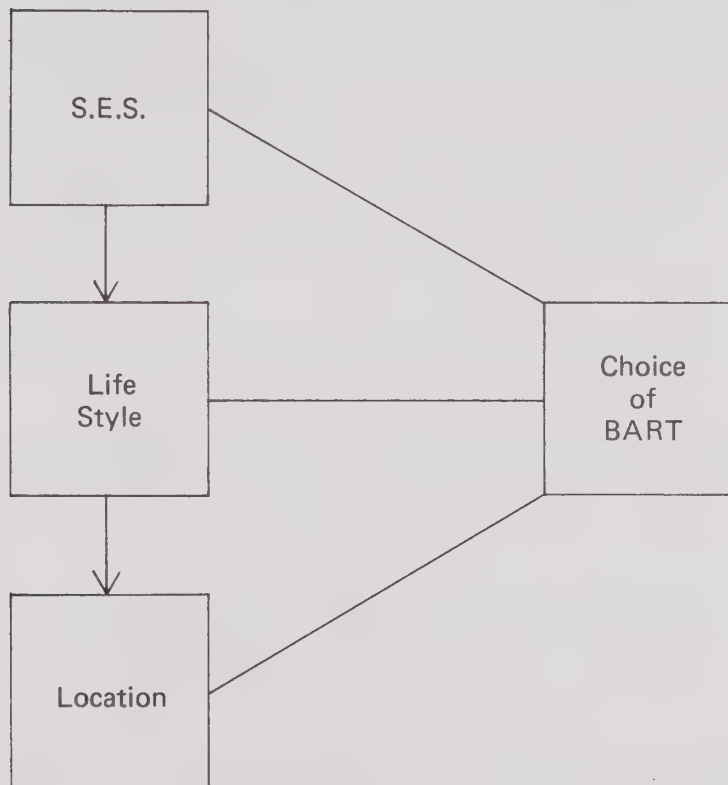
Life Style and Transportation Impacts - The Chain of Causality

When examining the interaction of new transportation systems and life styles we may look at the interaction in terms of:

1. The effects of life style on transportation mode choices;
or
2. The effects of transportation system changes on routine life activities of its users, including shopping, selection of places of residence, work, and recreation;
or
3. The direct and indirect effects of use of particular transportation modes on the pace, ambiance, comfort, ideas, imagery, and sense of well being of its users.

In the first instance, we look at the ways that life style interacts with locational and class factors to influence the choice of one transportation mode over another. This approach examines the social facets of life styles which influence the consumer choices of transportation modes. Here life style is the antecedent variable, which along with socio-economic and locational factors, determines the choice of transportation modes. Figure 2 depicts the conceptual path of this relationship:

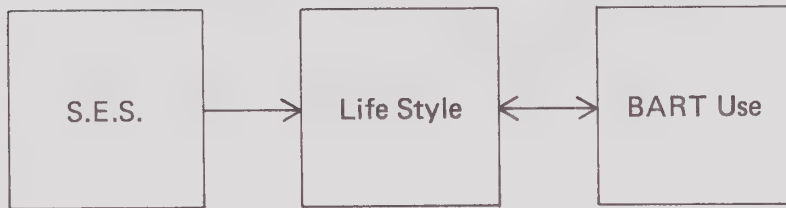
FIGURE 2 – LIFE STYLE AND CHOICE OF BART



In the second and third instances, life style and social economic factors interact with new transit use to co-determine changes in the life styles of its users. Here, transportation changes are a mediating factor in transformations in routine life activities. BART as a new transit system influences, along with socio-economic and life style factors, the organization of routine life activities like shopping, working, visiting, selection of residence, and recreation and leisure, as well as the quality, experience, and meaning of these activities.

This relationship is diagrammed on the following page with emphasis on the dynamic or interactive relationship between BART use and life style in determining changes or new routines in the life styles of its users.

FIGURE 3 – BART IMPACT AND LIFE STYLE



A Life Style Typology: Operationalizing The Concept of Life Style for Studying BART Impacts

In response to the need to conceptualize and research BART Impacts on the life styles of its users we developed a life style approach which deals with nine dimensions of routine life activities associated with transportation and transit use. These nine dimensions provided both the focus for in-depth panel research activities, and the conceptual framework for ordering and conceptualizing the impacts of BART on different facets of life style. These nine dimensions of life style are as follow:

1. Consumption and consumption style
2. Work and work related routines
3. Selection of residence location
4. Recreational and leisure activities and experience of the public space
5. Visiting with family and friends
6. Style and scheduling of routines, including the complimentary scheduling of routines among family members
7. The experience and use of public transit
8. Automobile access and style of automobile use

9. Ideational Normative Style - Beliefs and Opinions About Transportation, Public Transit, and the Environment

In the sections that follow we present the findings of our research on BART impacts upon the families and life styles of its users. The emphasis of our work has been upon the effects of BART use on the life styles of users rather than the life style factors which predispose individuals to use BART. (For a fuller discussion of factors underlying mode choice among BART users see: Transportation and Travel Impacts of BART: Interim Service Findings, 1976).

Nevertheless, our research has confirmed a view that consumer transportation choices are a part of a social fabric of socio-economic and social factors. The choice of a particular transportation mode and the meanings of this choice appear to be interwoven aspects of the process of people living their lives. Consequently, while our research focuses upon the effects of BART use for life styles, we have also identified some of the social factors which bring specific sub-populations of riders onto the BART system for particular trip purposes. Our findings on the distinctive life style types of different user populations also provide insight into the features of Bay Area life styles which encourage or constrain the use and meaning of BART for different population sub-groups. In the sections which follow we present:

- o A discussion of some of the factors which appear to influence the choice of BART.
- o A typology of the distinctive life style types which were identified among our panel of users and a sketch of the BART related impacts associated with use of BART by these groups.
- o A discussion of BART impacts upon the nine dimensions of routine life activities. Here, we specify the impacts of BART upon different facets of life style and distinctive differences in its impact upon different sub-populations of users, within these nine life style areas.
- o A section on conclusions and implications of our findings on BART's interim service impacts on Bay Area life styles.

III. FINDINGS

o Life Style and The Choice of BART

Structural and locational factors are generally more important than social and psychological variables in the determination of consumer mode choices. Choice of BART relative to other modes is greatest along the Concord Line for trips across the Bay to San Francisco. High corridor travel volumes combine with difficulties parking at central city travel destinations to encourage choice of BART along this corridor. The other high density travel corridor with high BART patronage is the Daly City line in the West Bay, which is a competitive alternative to the high travel volumes and parking difficulties encountered by auto users from south of San Francisco.

Choice of BART over car and bus modes is primarily explicable in terms of conventional structural considerations of travel time, cost, location of origins and destinations, travel wait times, and service reliability. Nevertheless, within the BART service area one is faced with the problem of explaining why consumers with similar travel origins and destinations differ in their selection of travel modes. Certain social factors appear to provide some insight into this mode selection process.

o BART Ridership: Age Stratification and The Socialization of Generations

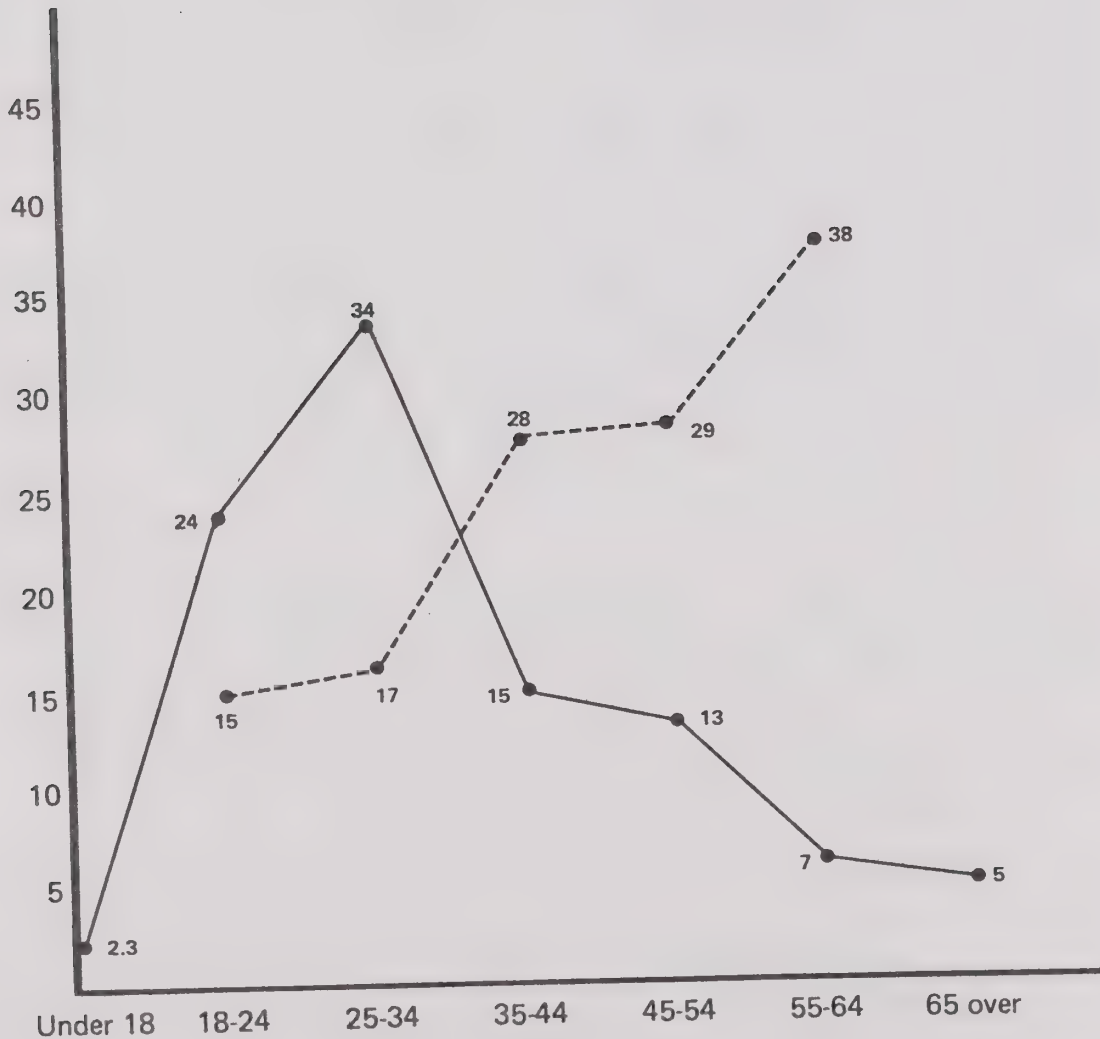
In assessing the life style factors which influence the choice of BART, and the likely impact of BART upon Bay Area life styles, it is important to place one's assessments in a definite historical context. Existing data on BART patronage versus bus ridership and in-depth interview data both provide support for conceptualizing BART as having a significantly different meaning for different age market segments within the Bay Area. Choice of BART and the impacts of BART on life styles appear to be stratified by age.

BART's current ridership is greatly comprised of individuals younger than age 34, as shown in Figure #4. According to the 1976 Passenger Profile Survey, 60% of BART riders are under 34, with the predominant rider group between 25 and 34. However, these data include no record of the under 14 ridership. According to our age observational census at six East Bay stations, but not including Berkeley (an area of high youth ridership), we found 15% of the patrons within the 11-19 age group. A reasonable estimate of all BART ridership under 34 years of age might approach 65%.

These findings are in contrast to those for bus patronage within the Bay Area. According to a BART authorized analysis of the demographic

FIGURE 4

BART RIDERS AND NON-RIDERS BY AGE



— % of Riders

--- % of Non-riders: per cent of non-riders within each age group

Source: Riders, 1976 PPS

Non-riders: BART Bay Area Public Awareness Study

character of the public transit market, bus users differ significantly from BART riders in a number of demographic attributes. In particular, bus users are likely to include a larger percentage of older adults than BART riders. This pattern of transit mode choice is supported by the findings of a random digit dialing survey of the three BART counties conducted in spring, 1975 (See Tables #2 & 3). In the survey, respondents were asked what mode they ordinarily use for travel to the central districts of San Francisco, Oakland, and Berkeley. While those under 25 years old comprise 42% of the BART users in the sample, those in the over 44 group include only 21.5% of the BART users. When we look at bus and streetcar ridership, we find a contrasting pattern: The under 25 group comprises 28.5% of bus riders while the over 44 group represents 41.5%. Thus, bus ridership is closer to the general population, of which 41% (according to the 1970 census) are over 44, while the 14 to 25 age group makes up only 25.6% of the population.

A comparison of BART riders and non-riders based upon the BART Bay Area Public Awareness Survey (1976) supports a generational view of travel mode choice. (See Table #4, page 29). Sixty-one percent of the riding population are under 34, compared with this age group's 43.9% of the three-county population (1970 Census). If we look at the composition of persons who have never ridden on the system we see a different pattern. Twenty seven percent of the non-riders are under 34 while 73% of these persons are over 35. The BART Market Segments Study also supports a generational view of ridership. The survey, which was mailed to selected types of households, indicates a disproportionate percentage of bus users among older citizens and a lower than expected percentage of BART users. Among youthful persons there is a disproportionate percentage of BART users, while among those between 35 and 55, we find an average-to-below percentage of BART use. We lack regional data from a large random sample to specify the relative levels of mode choice when we control for location, income, and car ownership. However, the pattern of patronage among BART riders makes clear that even when we control for income, youthful riders comprise a higher than expected proportion of the riding population.

The patterns of transit mode choice among the Bay Area population reflect their differential status in the generations of transit users. Older citizens came of age when the car was a luxury vehicle accessible only to persons of relatively higher incomes. They grew up experiencing the bus or trolley as transportation. Riding the bus is a normal feature of ordinary reality for this generation. Middle-age persons came of age in the period of expanding highway and freeway systems during the democratization of car ownership. They were the first generation for whom the automobile became the normal mode for routine transportation. Having grown up with the freedom and individual control over route and time the automobile provides, this generation still favors this mode for routine trips. Those under 34 are principally the

Table 2

CHOSEN TRANSPORTATION MODES OF DIFFERENT AGE GROUPS TO OAKLAND, BERKELEY, SAN FRANCISCO

BART COUNTIES – SAMPLE 1000¹

(Per cent of Age Group by Mode)
number = (n)

CHOSEN MODE	UNDER 25	25 - 44	44 OVER
BART	25 (16)	11 (14)	11 (8)
Bus Streetcar	34 (22)	18 (23)	42 (32)
Car Driver	30 (19)	57 (73)	33 (25)
Car Riders	6 (4)	5 (6)	5 (4)
Walk	5 (3)	6 (7)	9 (7)
Other	0 (0)	3 (4)	0 (0)
Total %	100%	100%	100%
Total No.	(64)	(127)	(76) N=267

1. BART Impact Program Areawide Travel Survey, 1975

TABLE 3

**AGE DISTRIBUTION OF TRAVELERS FOR
CHOSEN TRANSPORTATION MODES TO OAKLAND,
BERKELEY, SAN FRANCISCO
SPRING TELEPHONE SURVEY**

MODE						
AGE	BART	BUS STREETCAR	CAR DRIVER	CAR RIDER	WALK	OTHER
UNDER 25	42% (16)	29% (22)	16% (19)	29% (4)	18% (3)	0 (0)
25 - 44	37% (14)	30% (23)	63% (73)	42% (6)	41% (7)	100% (4)
44 OVER	21% (8)	41% (32)	21% (25)	29% (4)	41% (7)	0 (0)
TOTAL	100% (38)	100% (77)	100% (117)	100% (14)	100% (17)	100% (4)

N=267

generation of the 1960's war and postwar babies. They are a group of disproportionately higher educated individuals; products of the social and ecological consciousness and change of the 60's and 70's. Most important, they were educated within larger educational institutions and are principally employed as workers in an institutionalized world of abstracted, white collar labor. BART is a modern expression of the technological period of their emergence. It is important to maintain a balance between structural considerations and considerations of human consciousness and meanings. Younger persons tend to select BART both because of their structural connections to employment in the central cities and because of their socialization into a cognitive world in which modern, automated public transit is readily accepted as a routine feature of their environment.

Education is also a discriminating variable; the data suggest that selection of a transit mode is a feature of socialization into a particular generation and class with social meanings influencing transportation and other choices. (See Figure #5). When we look at the population of daytime BART users we find that 19.5% of this group are persons who completed formal education through high school or less (57.6% of this group has never ridden BART, although they comprise 36% of the three-county population). The picture with respect to college educated persons is the opposite of that for the high school educated group. Persons with four or more years of college education comprise 40.8% of the BART rider population, but only 16% of the district population; and only 18.5% of this group has never used BART. The pattern is clear: younger, more highly-educated persons select BART while older and less-educated persons are more likely to favor other transit modes.

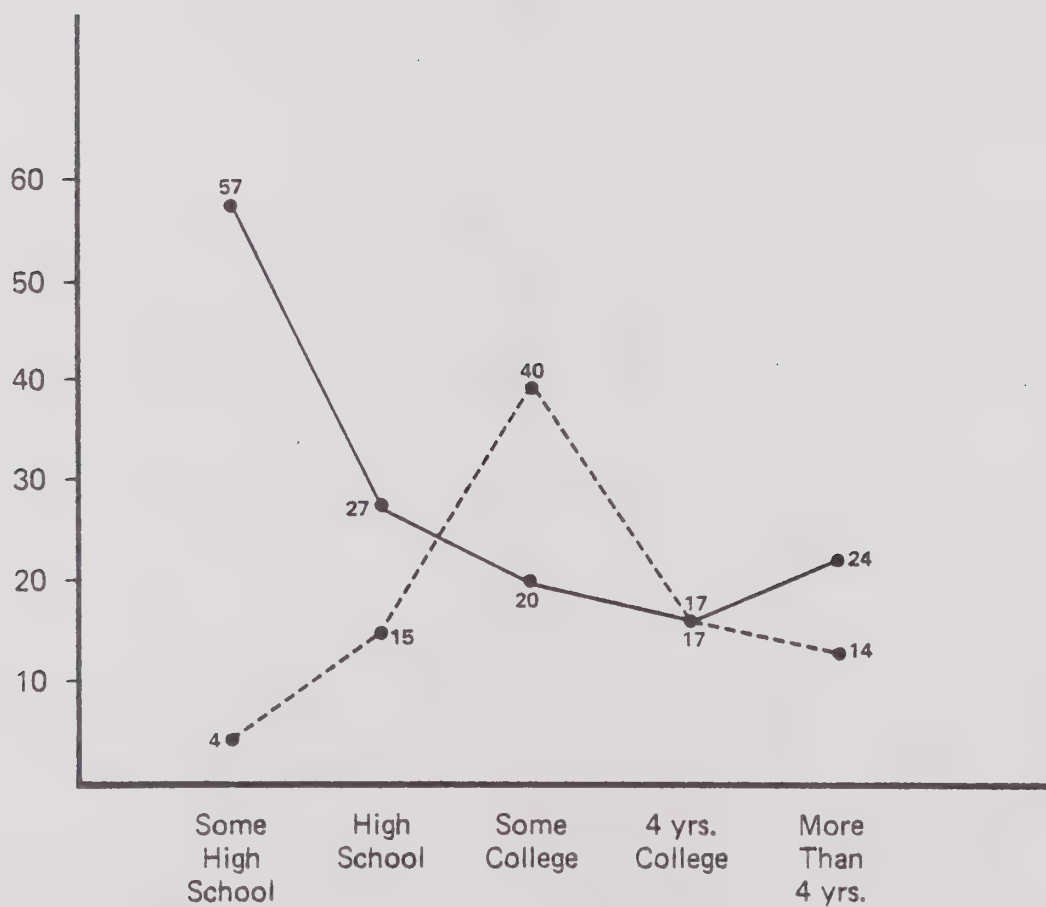
An analysis which took into account home and job locations, and other social variables, would likely indicate that part of the apparent relationship between age and experiences of higher education and the choice of BART is spurious. However, the data on BART riders and the field and panel interviews both contribute to a view that selection of BART is in fact rooted in sets of social meanings which are related to the age segregated and educational experiences of particular generations of transportation consumers.

o The Economy of Alternatives and Choice of BART

One fact which becomes increasingly clear in examining the Family Panel Interviews is that different segments of the population vary significantly in the range and variety of options that are available to them in the course of their daily routines. To a large extent the range of tangible options parallels certain indicators of SES. A perspective which looks at consumers' economies of alternatives is important to appreciate the differential meaning of BART for different segments of the population. Economics is generally defined as the practice of allocating scarce

FIGURE 5

BART RIDERS AND NON-RIDERS BY LEVEL OF EDUCATION



--- % of Riders

— % of non-riders (never ridden the system)

Sources: Riders: 1976 PPS day and evening

Non-riders: BART Bay Area Public Awareness Study

resources. And economics plays a significant role in the character of alternatives available to different categories of BART riders and non-riders, influencing their decisions of whether or when to use BART. Persons of higher income and those in higher status jobs generally have greater control over the hours of their work, the pace and character of their work routines, and the costs that they can reasonably manage for routine transportation. Lower-income and blue collar workers by contrast have much fewer options in ordering the work core of their routine lives. Their places of employment tend to demand fixed, regular hours of work. Their work activities tend to be fixed in one locational setting, and they have limited resources available for routine transportation. Similarly, the adult population tends to have a greater range of options than youth, particularly if we are concerned with freedom of movement within the region. Availability of options and alternatives influences both the choice of BART and the meaning of BART use, once chosen.

o Other Social Factors Influencing the Choice of BART

Our Family Panel Interviews suggest that certain social factors underlie the choice of BART for non-work trips among different life style sub-populations. Use of BART for non-work trips is related to family size and age (see Table #4, page 29).¹ Persons at earlier points in the life cycle, young singles, and younger families with fewer members are more likely to choose BART for shopping, recreation, and visiting family and friends. For these smaller households, selection of BART is related to both the greater frequency of recreational trips to areas served by BART among this group, and to the greater relative economy of BART travel for one or two persons. Other factors underlying the choice of BART and the social impacts of BART use by life style sub-populations are discussed below in the section on distinctive life style groupings.

o A Typology of Distinctive Life Style Groupings

Our Family Panel interviews reveal that there are a number of distinctive life style groupings among BART users. These groupings are identifiable as distinctive entities in terms of one or more of the nine life style dimensions or socio-economic characteristics such as age, ethnicity, household status, and family income, and in terms of location within the BART service region. Some of the groupings appear to parallel groupings that have been delineated in other areas through a regression analysis of travel behavior and socio-economic data from census and social service agencies (Bunker, et.al., 1977).

The groupings comprise clusters of population segments, with distinctive patterns of living that are partially related to their present use of BART. Particularly when looking at life style dimensions of shopping, selection of residence locations, visiting with family and friends, and consumption of recreational and leisure goods and services,

¹ Family size, along with other demographic factors, appears in the tables providing selected information on the demographic composition of the Family Panel, BART ridership, and the BART three-county population for certain key demographic characteristics, pages 29 to 34.

these groupings tend to isolate discrete sub-populations of the BART users. The distinctive life style characteristics of these groupings suggest the fabric of routine life style characteristics which delimit the types of chosen BART use and the present and potential impact of BART on the life styles of these segments. A survey of the life style of these distinctive groups, with a short discussion of their distinctive patterns of residence, shopping, visiting, recreation, and work related routines and patterns of BART and transit use follows below.

Type I: New Suburban-Home Centered

The New Suburban households are located primarily at the outer periphery of the Concord Line. Most families have moved to this area during the last year to four years. The decision to move to this locale was based upon the desire for a cleaner, country-like environment with good schools and in many instances was influenced by the desire to avoid driving the long commute to central city employment locations.

Most routine shopping is done within 3 miles of home. Local supermarkets and shopping centers are the prime locations for routine shopping. Shopping is usually done in the morning or afternoons by the housewife or on weekends as a family routine. Shopping at small stores and specialty shops is very limited. Similarly, special trips to the city for shopping are rare. The exception is shopping as a part of the BART work commute to San Francisco. This is a routine activity for a small segment of this group.

Recreation and leisure activities are oriented around the home. Home centered activities, gardening and do-it-yourself chores predominate. Attendance at movies, concerts, night clubs and other night life activities is rare. Eating out is generally done in the suburban periphery close to home. Recreational trips to San Francisco are unusual but when made, occasional BART use will occur. The main recreational travel activities are family group car outings for outdoor activities close-by, e.g., tennis, golf, and swimming, or for weekend trips to the country, beaches, or the mountains.

Family visiting is an infrequent pastime. Over half these families have been sufficiently mobile to become separated from their kin; they have no close relatives in the region. The only feature of regular family visiting by this group that appears to be BART related is the use of BART by some suburban youth for visits with separated parents, grandparents, or for travel to visit nuclear family members at their work locations.

Employment is principally located in downtown San Francisco. Most of these new suburbanites are employed at white collar jobs but a smaller segment are skilled blue collar workers with work or work base locations in San Francisco and Oakland. Most of these workers have some flexibility or control over their starting work hour, or are not penalized for unplanned tardiness. Among white collar workers, many (over one-third) have written work which may be done away from the work location. Among the New Suburbanites, organization of activities around occupational priorities parallels the home-centered suburban orientation. Work based in the central city and the demands of the work routine are the only routine urban facet of these New Suburbanites' life styles.

Household income averages above \$20,000, the highest of the BART life style groupings. Virtually all households have access to at least one car, with multiple car families being the mode. With the exception of BART use, use of public transit is not a feature of their routines.

Summary of BART Impacts:

BART influences the choice of residential location; it makes possible the combination of a country residence with central urban employment without the requirement of a driving commute to work. BART also enhances the independence and freedom of movement of one car family members and suburban youth. Nine per cent of all youth on the BART system under 18 board at Walnut Creek. Over 40% of the Lafayette station patrons are under 25. BART enhances the range of experience, travel destinations, and freedom of suburban youth and other transit dependent family members in New Suburban households. BART does not significantly influence the taking of trips to urban areas, for non-work purposes, because these trips are not facets of the New Suburban life style, irrespective of travel mode.

Typical BART stations: Walnut Creek, Lafayette, Pleasant Hill, and Orinda.

Type II: Cosmopolitan Urban Household

The Cosmopolitan Urban families have lived in locations close to the urban centers or within older suburban areas for a longer period of tenure than most New Suburbanites. Neighborhood tenure generally exceeds five years; among those with longer tenure, owner occupied older single family homes are the predominant mode of residence. For those among this group with newer residential locations, there are a significant number of renters in multi-family and apartment buildings. BART or public transit were not generally at issue in the selection of locations of residence. Job location, good neighborhood characteristics, and housing values were the predominant reasons offered for residential location decisions.

For these families, primary shopping involves a mix between local supermarkets and shopping centers and patronizing small neighborhood and specialty stores. Some of these shopping trips to smaller stores are regularly done on foot, particularly in the Rockridge and Mission 24th to Glen Park areas. Specialized shopping trips to downtown San Francisco and Oakland for goods not available nearby are a feature of this groupings' consumption routines. Some of these downtown trips are BART trips and BART appears to increase the frequency of these downtown shopping trips. Access to the urban centers is considered a virtue but the Cosmopolitans' are often desirous to avoid the problems of driving and parking downtown (particularly in San Francisco).

Recreational and leisure activities for the cosmopolitans include the local and country outdoor family car outings of the New Suburbanites. However, this group also maintains a connection with urban based recreational activities; they attend movies, concerts, sporting events, theatres, and travel to restaurants in the central cities of San Francisco and Oakland.

Family visiting is somewhat more frequent for this group than for the new Suburbanites, as they have more family ties in the region. However, family visiting is still a relatively infrequent activity and visiting is normally done by car during the weekend or on holidays. Among this group there appears to be a significant component of one car households where mobility of family members is enhanced by the use of BART for work trips by one or more family members. Use of BART makes the one family car more available for use for local travel.

The cosmopolitan families have a somewhat lower average income than the New Suburbanites. Incomes range from \$10,000 to \$25,000 with most family units falling in the \$15,000 to \$25,000 range. Although most family units have car access, car ownership is less extensive than among families in the Newer Suburban zones. Local car travel and BART work travel, travel to downtown, and occasional recreational travel is supplemented by some use of public transit, particularly in the West Bay. This group is distinguished by a cross-mix of suburban activities and orientations and a greater orientation towards urban and cosmopolitan goods and recreational pastimes.

The Cosmopolitans are primarily employed in white collar positions with some flexibility and control over the hours of work. However, a larger component than among New Suburbanites are employed at educational institutions or within the governmental sector. Also, employment by both adult members of family households is more prevalent among this group.

Summary of BART Impacts:

BART is employed regularly for the work commute trip to Central City locations in San Francisco, Oakland, and Berkeley. It is used less

regularly for specialized shopping trips to the urban centers of San Francisco and Oakland. BART appears to enhance the frequency and ease of these specialized shopping trips. BART is also employed by this group for occasional recreational trips to sporting events at the Coliseum and to cultural and recreational locations in downtown San Francisco and Oakland. BART enhances the mobility and freedom of movement of the one car Cosmopolitan families where one or more household members regularly use BART for the work commute. In some Urban Cosmopolitan areas BART is experienced as enhancing the value and desirability of family residences (e.g., Rockridge). But, BART was not generally a factor in the selection of residential locations for purchase of single family homes.

Typical Stations: Western and Southern areas of Mission-24th Street, Glen Park, and Balboa Park in the West Bay and Rockridge, North Berkeley, and El Cerrito in the East Bay.

Type III: Ethnic Urban and Older Suburban Families

This life style group is a regionally dispersed aggregate in terms of residential locations. They primarily reside in older suburban and urban homes and apartments in Richmond, Daly City, Oakland, East Oakland, Berkeley, San Francisco and Hayward. Public transit access as a facet of residential choice appears to have been an important consideration for a sizeable segment of persons with no or limited car access. For others, selection of home locations was tied to friendship or kinship ties, housing value and availability, and other non-transportation factors. Residential tenure at present locations varies from less than one year to over ten years.

Shopping routines among this group are very similar to the patterns of the Cosmopolitan and Urban aggregate. Shopping is principally done at larger super markets and shopping centers close to home. However, there are also secondary shopping trips to specialized food stores dealing in ethnic foods, close to home and within regional ethnic centers. Shopping trips are made by foot or car close by and by car or bus with occasional BART trips to more distant regional ethnic shopping areas. The lack of weekend BART service curtails the use of BART for their specialized shopping needs by transit dependent shoppers among this group.

This group appears, from our interviews, to be very socially active. They engage in a relatively diverse variety of different types of recreational and cultural activities. Recreation appears to regularly include attendance at night clubs, concerts, clubs, dances, athletic events, parties, eating out, with less common trips for bowling, outdoor sports and events, etc. These trips are taken by car, in a friend's car, or where car access is not available, by bus. The non-availability of BART service

during late night and week-end periods seems to limit, along with non-tangible factors of modal preference, the use of BART for these recreational activities.

Visiting with family members is the most distinctive differentiating characteristic of this aggregate. More than among any other groups, family visiting appears to be an ordinary and routine feature of the activities of Asian and Spanish heritage families in our panel. Visiting is primarily by automobile on weekends. However, transit dependent persons within this grouping report regular but infrequent use of BART for family visiting where service is available and convenient to visiting destinations. For visits to locations on the Concord Line, BART is experienced as facilitating and making more pleasant public transit to the homes of extended family members.

For Spanish heritage households, visiting with friends often includes activities with cousin and uncle peers, a feature of kinship which is distinctive and differentiated from the patterns of visiting and recreation reported by other groups. This group had the highest percentage of blue collar employees and the least control over the hours and scheduling of the work day. They also have a lower median income than the other aggregates from the panel interviews. Incomes ranged from below \$5,000 to over \$25,000. Use of public transit is common for those with limited car access among this group (a sizeable segment). However, where cars were available they were experienced as important facets of routine life; esteemed for their style, their comfort, the control over route and timing they provide, and their space as a locus for socializing and going out on the town. In this respect, the Ethnic aggregate more openly expressed identification with and esteem for the virtues of their private cars than the Suburban and Cosmopolitan groupings.

Summary of BART Life Style Impacts:

Among this aggregate BART makes possible more extensive family visiting and more comfortable travel to non-work locations during the week, for those persons who lack automobiles. For the group as a whole the primary use of BART is still for work related travel to San Francisco or Oakland along densely traveled corridors. As with other groups, BART is selected for the work trip because of its greater comfort and speed relative to the bus. This group which travels most for recreation, travels at times and to places not adequately served by BART. BART seems to make little impact on the choice of locations of residence. Nor does it appear to influence the taking of more frequent trips to the central city areas for shopping or recreation.

Typical BART Stations: Daly City, Richmond, Ashby, Hayward and Lake Merritt.

Type IV: The Young Singles

This life style grouping is dispersed throughout the service region. However, this grouping is more highly concentrated in the urban periphery and the older suburban neighborhoods. Tenure of residence is generally short with the exception of those persons living with their nuclear family. This group includes a large percentage of renters and a small segment of home owners.

Shopping is done primarily at supermarkets but this group reports more frequent shopping trips for non-food items to the downtown areas. Also, BART shopping trips and shopping trips as part of the BART work commute are more prevalent among this group. Shopping for clothes and home accessories seems to be an important feature of routine activities for this segment.

This group reports the greatest variety of recreational and leisure pursuits. Regular recreational trips include going to movies, discos, concerts, out to eat, parties, sporting events, outdoor trips, and visiting. The predominant time frame for these activities is on weekends. But this group engages in more mid-week recreation than any other life style segment. The predominant BART use for such recreational outings is for visiting trips during the week, travel to Coliseum sporting events, and occasional nights out in the central city of San Francisco.

This group has a generally lower income than the other life style types. Incomes range from below \$5,000 to \$25,000 and above, with the mode between \$7,000 and \$15,000. Employment seems mixed between white collar central city employment and white and blue collar employment at locations dispersed throughout the region. The principal purpose for BART travel is the work trip, but this group is more likely to combine another trip purpose, e.g., visiting or shopping, with their regular commute. With lower car availability this group has a higher than average use and dependence on BART and buses for its routine travel.

Summary of BART Impacts:

BART influences the rescheduling of some recreational, visiting, and family trips to the weekday time frame. BART facilitates and increases the frequency of these trips, particularly for transit dependents. BART appears to have very limited impact on choice of residence location and appears to be somewhat less important for the work trip than for the New Suburban and Cosmopolitan groups. BART is used for the widest variety of activities by this group as a corollary of their more extensive travel for visiting, recreational, shopping and educational trips.

Typical BART Stations: Berkeley, North Berkeley, Balboa Park, Daly City.

Type V: The Elderly

This grouping of senior citizens over 65 years of age, is dispersed throughout the BART service region. However, there are concentrations of elderly who are most frequent users of BART in the urban center of Oakland and in the communities of new suburbia. These persons reside primarily in multi-family and apartment dwellings in the central city areas and in newer single-family homes and apartments in the New Suburban region. Tenure of residence is generally long or involved a relocation to a suburban place of residence within the last one to five years. Proximity to family or friends appears to have been the primary criteria for selection of residence location; although, for those persons selecting residences in the last five years, proximity to public transit was sometimes an important consideration.

Shopping is done primarily at shopping centers close to home. Shopping trips for non-car owners often involve being driven by a friend or family member for special weekly or bi-weekly shopping trips. However, this group relies more on small neighborhood stores close to home than the New Suburbanites; unlike the Urban Cosmopolitans, selection of these small stores is based more upon proximity and convenience than upon the selection of specialized foods or goods.

Recreational outings are limited and consist primarily of visiting with family and friends and some outdoor trips by car to locations like Lake Tahoe or Reno. An exception to this pattern among BART users are non-specific sightseeing and excursion trips on BART, and occasional trips from the urban center to suburban shopping centers.

Occupational factors are less important for this group. About three quarters are retired or semi-retired from positions in the regular work force. Among those employed, vocations vary from skilled blue collar occupations (e.g., printer) to a variety of white collar occupations.

Household income for this group ranges from \$5,000 a year to over \$25,000. Among BART riders, central urban residents are more likely to have lower incomes and less access to car use while the New Suburban Elderly are more likely to have higher incomes and higher car availability. Use of public transit is widespread where car access is unavailable and transit service is accessible. BART use is highest among this group in the Central City area of Oakland and in the New Suburban area of Walnut Creek, where a special BART feeder from Leisure World, a senior citizen residential development, facilitates BART use among elderly travellers.

Summary of BART Impacts:

Among this group BART impacts are greatest for off-peak travel for visiting with family and friends, among persons with limited car access, and for shopping and recreational trips. Field observers located a significant number of elderly persons who take non-specific sightseeing

and excursion trips on BART as an inexpensive form of recreation. Travel for night recreation or leisure activities is rare. Regular commute work use is the primary BART use of employed members of this grouping.

Typical BART Stations: Walnut Creek, Oakland 12th Street, and Oakland 19th Street.

o Selected Demographic Characteristics
Of
Family Panel and BART Ridership

The following tables provide selected information on the demographic composition of the Family Panel, BART ridership, and the BART three-county population for certain key demographic characteristics. These data provide a contextual base for the findings on BART's impact on the life styles of its users.

TABLE 4

DEMOGRAPHIC PROFILE OF PASSENGERS AND NON-RIDERS

(Figures in Percentages)

	DISTRICT POPULATION 1970 CENSUS	TOTAL DAY 1976 PPS	PEAK 1976 PPS	OFF PEAK 1976 PPS	EVENING 1976 PPS*	NON-RIDERS BAY AREA PUBLIC AWARENESS SURVEY
Sex						
Male	48.2	53.4	49	54	72.1	
Female	51.8	46.6	51	45.9	27.9	
Age						
14-34 under	43.9	61.2	69.7	61.3	68.5	27.0
35 above	67.2	38.8	30.3	38.7	31.5	73.0
Income						
Less than 10,000	25.4	31.3	23.6	37	35.1	31.8
10,000 - 19,999	41.6	33	34.8	31.8	31.9	39.6
20,000 and more	33.1	35.7	41.6	31.2	33	28.7
Education						
High School or less	70.5	19.5	16.9	21.8	18.8	57.6
Some College	14.9	39.7	40	39.6	39.2	23.9
College - 4 yrs. or more	14.6	40.8	43.1	38.6	42	18.5
Race						
White	67.8	72.7	71.7	82.5	80.9	81.5
Black	12.0	11.2	11.5	10.9	7.6	11.7
Spanish Heritage	12.6	5.9	5.5	6.4	4.8	4.5
Other	7.4	10.2	11.3	9.2	6.6	5.5

*Not weighted for response bias.

TABLE 5

BART RIDERS BY RACE

(Figures in Percentages)

ETHNICITY	BLACK	WHITE	SPANISH HERITAGE*	ASIAN
Family Panel	9	72	11	8
BART Riders (All)	11.2	72.7	5.9	8.4
BART AM Peak	11.5	71.7	5.5	9.7
BART Off Peak	10.9	73.5	6.4	7.1
Census Estimate	12.0	67.8	12.6	7.4†

Source: 1970 Census, 1976 PPS (weighted)

*Spanish Surname or Spanish Language

†Asian and other non-white

TABLE 6

SEX OF BART RIDERS

	FEMALE PERCENT	MALE PERCENT
Family Panel	43	57
All Day	47	53
AM Peak	51.1	48.9
Off Peak	45.9	54.1
Evening	27.9	72.1

Source: 1976 PPS

FAMILY PANEL
HOUSEHOLD AND TYPE OF BART USE

	TYPE OF BART USE*					
	HOUSEHOLD STATUS	WORK	WORK AND NON-WORK	NON-WORK	TOTAL PERSONS BY HOUSEHOLD SIZE	BART RIDERS NO. OF PERSONS IN HOUSEHOLD
NO.: ROW PCT.: COL.PCT.:	SINGLE	5 21.7 16.7	10 43.4 34.6	8 34.7 50	23 30.7	20.5
NO.: ROW PCT.: COL.PCT.:		8 38 26.7	10 47.7 34.5	3 15.3 18.8	21 28	
NO.: ROW PCT.: COL.PCT.:		2 16.7 6.7	7 58.3 24	3 25 18.8	12 16	
NO.: ROW PCT.: COL.PCT.:	THREE FOUR OR MORE	15 79 50	2 10.5 6.7	2 10.5 12.5	19 25.3	16.9 31.5
NO.: ROW PCT.: COL.PCT.:						
NO.: ROW PCT.: COL.PCT.:						
COLUMN TOTAL		30 40%	29 38.7%	16 21.3%	100.0	100.0

*INCLUDES REGULAR AND OCCASSIONAL BART USE.

TABLE 8

FAMILY PANEL MEMBERSHIP
BY OCCUPATIONAL CATEGORY

EMPLOYMENT CATEGORY	NO.	PERCENT OF PANEL
White Collar Managerial, Professional	35	46.7
White Collar Non-Professional	20	26.65
Blue Collar	14	18.65
Housewives	3	4
Retired	3	4
	75	100.00

TABLE 9

AUTO OWNERSHIP AMONG
PANEL FAMILIES
(Figures In Percentages)

		NUMBER OF AUTOMOBILES			
		0	1	2	3 OR MORE
PERCENT		24	29	39	8
NUMBER OF HOUSEHOLDS		18	22	29	6
					100%
					75

AUTO AVAILABILITY FOR BART TRIP
ALL BART RIDERS*

(Figures In Percentages)

	NO	YES
ALL BART RIDERS	38	62
AM PEAK	32	68
OFF PEAK	44	56
EVENING	48	52

SOURCE: 1976 PPS

*THESE PERCENTAGES REPRESENT PERSONS WHO REPORTED WHETHER A CAR WAS AVAILABLE FOR THE TRIP THEY WERE MAKING ON BART.

o BART Impacts on Consumption and Consumption Style

Four young housewives were travelling home on the Concord-bound rush-hour train. Their arms were full of packages, mostly flowers and dried flowers and small household objects from a San Francisco import store. They were giddy and laughing, joking with each other about their purchases and about being late and their husbands expecting them home. They were a startling contrast to the generally restrained rush-hour commuter returning home after a day at work. When I inquired, they assured me that they probably would have taken the trip by car if there were no BART. But they figured it would be fun to ride into the city on BART, just for a change. Particularly since "none of us really like driving in San Francisco."

Mr. C. said his wife likes to go shopping on BART, sometimes three times a week. They have a limited income and from what he said, his wife goes shopping as much for fun as to go out and buy things. (Notes from a Family Panel case interview: Mrs. C. does not drive.)

One sensitizing perspective that guided research activities from the start was that BART would affect non-essential travel beyond simply providing a new form of access to a former destination. Interviews with Family Panel members make clear that BART changes the nature of non-essential shopping trips for those who use BART for this purpose. For some panel members, it results in combining shopping with a special type of outing with friends. The field report on the four housewives makes it implicitly clear that they were on a special kind of outing on BART while shopping. Another example is offered by a male panel member:

. . .The other time Mr. M. regularly uses BART is when he goes shopping for clothes which he does on Union, Sutter, and Polk. He enjoys this kind of shopping and would have driven before BART. He stated that he uses BART on these trips because "it frees him and gives him mobility."
(34, San Francisco white collar, single)

Persons who have the option of car access to downtown shopping locations choose to use BART because it makes the trip easier, more interesting, or part of a special outing with friends. Using BART also seems to

involve a shift in shopping locations away from closer or suburban centers toward downtown San Francisco. BART expands the horizons for the shopping experience.

She always takes BART to Oakland (to go shopping) unless she has a lot of stops to make, in which case she drives because BART is too inconvenient in those situations. She did not shop much at all in San Francisco before BART and feels that BART has made a difference in her life. She used to drive to Oakland. Basically, she enjoys shopping for household items and gifts. . . .and often makes it into an outing. (Castro Valley, housewife, Panel member)

Mr. L. buys a lot of records, and some music equipment. He sometimes rides into San Francisco on Fridays (his day off) to buy music related things. .'. .There are more stores with more selection in San Francisco. (Family of two, El Cerrito Del Norte)

Mr. C. mentioned that now they do more shopping in Oakland and San Francisco on BART and his wife has started to get her hair cut in San Francisco. (Family of three, Berkeley)

While some car owners report an increase in their shopping trips to CBD areas since BART, BART does not appear to influence their routine shopping for regular consumption goods. This shopping is done at shopping centers and discount markets close to their homes.

Mrs. B. goes shopping every Wednesday at the local Safeway (200 yards away) or Brentwood Shopping Center (1/2 mile). "Other" shopping is usually within five miles of their home. (Family of two, San Francisco)

BART is a facilitating and enriching option which encourages more frequent trips to the city centers and helps to make these trips special kinds of outings.

Consumption Impacts for Transit Dependent Users

Transit dependent persons' view of BART's impact on their freedom of consumption choices is significantly different. Where people lack easy car access to shopping areas, BART's entry into the shopping routines is an event of larger moment.

For all other shopping (non-food), she goes to downtown Oakland or El Cerrito Plaza by BART about three times a month, even in the evening. Without BART she would have to take a bus. Having BART is great for J. because she

detests the bus so much. She knows she would not go to El Cerrito and Oakland as much if she had to ride the bus. BART makes the whole trip enjoyable.
(Secretary, Berkeley)

In Concord, the only buses are BART feeder buses. Aside from BART, Greyhound is her only way to get around, and the Greyhound is too expensive for her low income. She must plan her shopping (and other) trips around the schedule of the BART feeders. (Single female, 67, Concord)

However, those who are dependent on public transit feel an inconvenience from the lack of weekend service. Both regular public transit users and car owners report that the weekend is their usual time period for making most of their shopping trips.

Consumption Impacts Among Suburban Residents

Among new suburban residents, the automobile is assumed to be the chosen and normal shopping vehicle. The social or family nature of the shopping trip re-enforces dependence on the car as the routine shopping mode for a significant portion of panel respondents.

Shopping trips occur once a week on weekends and all family members make the trip. They choose to use their automobile as the shopping area is within two miles of home. (Two car family of three)

While a significant minority of panel members either presently use BART for shopping trips to the San Francisco CBD area or imply their readiness to try BART when weekend service is available, some suburban respondents have no desire to go outside of their usual suburban shopping area. They don't yet perceive the CBD areas as providing any higher quality, style, or assortment of goods.

Mr. and Mrs. N. always go shopping together, accompanied by one of the children occasionally. The shopping centers are about one mile from their home, they drive and always go shopping close to home, saying, "you can't get anything in San Francisco that you can't get in shopping centers..."

Nevertheless, while the car combines with suburban shopping centers, discount stores, and suburban department stores as a consumption style of choice, the expansion of BART service to a weekend schedule would encourage an increase in BART use for shopping trips to the CBD.

Mrs. H. uses her car to get to shopping centers, and does this shopping on Saturdays. "If BART ran on Saturdays, I would take BART. If BART ran on Saturdays, I would shop in different places than I do now, to some extent."
(El Sobrante housewife, middle 30's, one car)

Under present interim service conditions, 12 panel members, or close to 17% of the panel, report using BART for shopping trips to the CBD area of San Francisco or Oakland. Over half of these respondents report making more frequent trips which otherwise would not be taken. BART is a special vehicle of choice for certain types of shopping trips.

Shopping as a Facet of the Work Trip

Since the advent of BART, I. has been prompted to shop more on her trip home. Since there are many markets in the vicinity of the Richmond station, she finds it very convenient to just run in and pick up a few things each day. (Two cars, two person household)

Six panel members or 9% of the panel report taking noontime or after work shopping excursions as part of their regular commute use of BART. For some respondents, this may involve a special trip to go shopping during the lunch hour. Ms. W. takes a BART train from her work area near Civic Center just to look around and shop at the Embarcadero Center. It tends to break up her day and gives her a chance to shop in stores she wouldn't ordinarily get to. Other respondents report being encouraged to stick around and look through shops when they are riding BART.

Mr. T. works odd hours so sometimes Mrs. T. will just stay in the city and shop, wander around and meet people. She would not do this if she drove because she would be thinking about the extra hour or so of parking she would have to pay for. (Family of two, El Cerrito)

Ms. W. says she would be reluctant to do this (shop around in downtown San Francisco) if her car was right there in the garage.

Many of the discount garages close or charge more around 5:30 or 6:00 so there are often real constraints urging the San Francisco work commuter to leave the area more quickly when using the car than when taking BART to work. The combination of the after-work shopping trip with the work trip is one of the subtle shifts in the life style routines of regular BART users which is difficult to assess in terms of its specific life style impact. However, it is an emergent feature of a shift towards integration of work and life routines. To the extent that BART stimulates and encourages this shift, it facilitates a move away from the total segmentation of central city work and suburban and home life activities.

Bart Impacts on Non-Essential Shopping Trips

One possible expectation for BART was that it would alter the patterns of nonessential shopping among Bay Area residents. Among our family panel and from an analysis of trip purposes of regular BART riders, we find that BART has only a limited impact on consumption behavior. However, infrequent users of BART do report shopping in downtown San Francisco or Oakland as a relatively frequent non-routine trip purpose.

BART conducted a survey based upon intercept interviews in downtown Oakland and telephone interviews in Walnut Creek, Fremont, and Hayward, on the effect of the downtown Oakland and San Francisco Liberty House Department Store offer to provide a free BART ticket with each purchase over \$5.00. The results of their interviewing in downtown Oakland and suburban areas suggest that BART does have some impact on non-routine shopping trips to the goods and style centers of San Francisco and Oakland.

	Shop at Liberty House Downtown Oakland	% of Shoppers Using BART
Suburban (100)	3%	66%
Downtown Oakland (335)	25%	14%

Among respondents in downtown Oakland, 27% expressed an awareness of the Liberty House promotion.

Further, attempts at specific promotions of BART appear to encourage people to take non-essential shopping trips on BART. Given the tendency for most households to conduct non-essential shopping on the weekend, the observed BART impact during interim service is a likely indication of potential impact under full service conditions.

BART is chosen by irregular riders as a reason (along with the desire to go shopping) for special shopping trips to the CBD area. Over one-half of BART riders are non-peak travellers and 7.1% of off-peak and 1.9% of evening users report using BART for shopping excursions.

o Work and Work Routines - Changes in the Work and Work Related Activities of BART Work Commuters

It is in the area of work-related BART use that we find the most consistent and uniform evidence of BART's impacts on the routines of its riders. These impacts are largely a statement about the nature of most prevalent BART use, since the work trip is the primary trip purpose of 50-60% of all adult BART users. (PPS)

To a large extent, the observed BART impacts on work related routines are related to its characteristics as a new type of access vehicle for the work trip. These impacts fall into three categories:

(1) Changes in the scheduling and time of the work trip. This includes changes in the departure time to work and the timing of the return trip; changes in the scheduling of the time frame for the work day; and changes in the elapsed time spent travelling (time gained or lost). While it is relatively easy to determine the time adjustments which occur in conjunction with our Family Panel's BART use, it is difficult in many cases to ascertain the life style impact of these scheduling and timing adjustments.

(2) Changes in the timing of work trips combine with the particular characteristics of the BART travel mode to create changes in the pace, ambience, and sense of time of regular commuters and the experience of psychological effects of the work commute.

(3) Changes in the location of work, work done in transit and work-related activities.

Changes in the Scheduling and Timing of the Work Trip

E. was censured for arriving late to work due to BART inconsistencies. He now gets up earlier and catches an earlier train to insure arriving at work on time.
(Blue collar worker, Concord)

Mr. M. uses a car pool and BART to work. (He used to travel on the bus.) He has found that he spends less time in travel this way and can leave for work later.
"During the week BART affords me more time for doing other things. . . ." (Government Services, Manager, Daly City)

Reports of changes in the scheduling of work trips with regular BART use follow a consistent pattern. Among former bus riders, BART is experienced as an occasional time saver. Among persons who compare their BART use with automobile access to their work places, BART is generally reported to be slower, from 10 to 30 minutes more than their trip time when travelling by car. The exception to reports of greater travel time travelling by BART are comments from some travellers along the Concord line, Daly City line, and some Alameda line users. Among those respondents, BART is experienced as a time saver when it runs without mishaps.

However, virtually all regular BART users who must arrive at work at a relatively fixed time report adjusting their travel schedules to include

a certain amount of leeway time against late arrivals when BART experiences travel delays.¹ What is significant is that BART requires routine morning and evening schedule adjustments among its regular users. However, in most cases, respondents have difficulty identifying what actual reorganization of their routine activities they implement to accomplish this change in their schedules. Respondents are generally unsure about the changes in their household routines accompanying schedule changes, but they do recognize changes in what they do and how they feel travelling to and from work.

Since it costs him one day's pay if he is late, he schedules his BART arrival to work 20 minutes early, which allows him time to read the morning paper and relax. (Printer, Alameda to San Francisco)

"If I drove, I would not have to allow the extra time. I use BART because of the comfort and to get away from the heavy traffic in the morning and the afternoon. . . .if I've had a bad day at work, this (my BART return trip) is a good time to think about it." (Plumber, Walnut Creek)

BART work commuters appear to adjust over time to the variable scheduling and travel time of BART commute trains. Those who have control over the hours of their workday are likely to change their hours of regular work so that they can avoid the crowding and relatively more frequent delays during the peak travel periods.

"(BART is). . .an excuse used to change my work schedule. Now I work 9 to 6 instead of 8 to 5 to better utilize BART when it's less crowded." (Mission & 24th Street, Downtown San Francisco, no car)

Mr. F will leave at 3:50 or after 6:00 p.m., depending on how much work he has to do. If he is all caught up, he will leave a little early; if not, he will leave late. Mostly, he changes his work departure times because he wants to avoid the rush hour crowds on the trains. (Retail manager, Pleasant Hill)

However, for blue collar and white collar workers who do not have control over their scheduled work starting and departure times, pressures exist to either adjust their BART scheduling or discontinue using BART.

Ms. B. started off by taking BART to work round trip. Too many delays caused her to switch over to AC Transit in the morning, which is cheaper and more dependable. She rides BART home. "BART is easier." (Purchasing agent, single, Berkeley to San Francisco)

¹ For a discussion of the reliability of BART's service, see Appendix A, Page 116

An Eastbay blue collar union steward reported that many workers he knows would like to ride BART but they cannot depend on it. They have union contracts which say that tardiness is grounds for violation of the grievance procedure. They must be on time, so most of them go back to driving their cars, which they know they can count on.

The greater the relative control which individuals have over their hours of regular work, the more likely they are to work out arrangements in their hours of work and work travel to make most positive use of BART within their routines.

Changes in the Pace, Ambience, and Sense of Time of Regular Commuters

Social economist Staffan Linder (1970) discusses the change in peoples' relationship to time which accompanies the process of industrial development in advanced industrial nations. Time is relentless in following the economies of the market and the work place of the society in which people live. Proliferation of development results in a proliferation of options and alternatives for the use of time. Moreover, as one rises in the socioeconomic hierarchy, time also becomes more valuable in both the productive sphere and the leisure sphere of consumption. Hurry, hurry. . .there just isn't enough time.

Initial responses among regular BART users were strongest in their reaction to the unreliability of BART service. The variability of train travel times for the same trip from day to day reportedly made it very difficult to budget one's time when using BART. A trip from the suburban periphery could take 35 minutes one day and an hour another day. Regular BART users had very strong feelings about the effects of this unreliability upon the time planning of their daily routines.

. . .Getting up so early to make up for BART delays really affects her if BART breaks down on the ride home. "Then I get mad. It seems unfair to put in so much time in the morning to compensate for BART and then get home late too."
(White collar worker, San Leandro, Bay Fair)

In fact, the inability to have control over the budgeting of one's travel time on BART did result in the changing of travel modes for a segment of our Family Panel. However, the majority of Panel members' views reflected in the earlier interviews indicate attempts at varying degrees of sophistication and refinement to maximize their control over the loss of time that seemed to accompany their regular BART use. Over the last year, these calculations are reflected in the patronage volume at origin stations along the system's lines. Oakland West, the last station before crossing under the Bay to San Francisco, experienced an increase in peak period patronage, with many of these patrons coming from locations far from the station area. The six Panel members who regularly use Oakland West as their morning departure point reflect the calculations

of some BART users who use whatever means are available to maximize their control over the time necessary for their regular work commute trip.

Mr. T. has a complicated way of getting to work. He drives from his Moraga home to the Oakland West station and takes BART from there to Montgomery. He could also drive to the Orinda station and ride BART all the way, but he has timed the trip and found that his way is faster. He could also drive all the way in; however, parking facilities are so far from his office he would have to walk an extra ten minutes from the parking lot. He figures that his route is 3 to 10 minutes faster than driving all the way. Also, by going to Oakland West he has the choice of two trains into the city which helps protect him against unplanned delays. (White collar executive, family of 4)

Linder talks about the increasing scarcity of time among affluent white collar workers. BART unreliability demands to some extent an element of surrender of one's control over time maximization. One particular feature of the automobile which is reflected in the panel interviews with automobile users is the ability to use the car to seek out and follow the most time efficient route to one's regular destinations.

Mr. T. likes the fastest most direct routes. He travels the back streets for local trips, and freeways for longer trips as time is very important to him. (Orinda, family of 4)

John likes to experiment when driving his car in the East Bay. He drives different routes and occasionally times how long they take. He prefers fast routes but sometimes uses slower, more scenic routes when he has the time. (Fruitvale, family of 4)

The car is tailored to maximization of one's control over what seems to be the most time efficient route for one's regular trips. However, as the Panel interviews reveal, the car during rush hour has the disadvantage of forcing one to travel through tight bumper-to-bumper traffic and the discomfort and uncertainty of unexpected delays along tunnels, bridges, and interchanges of regular commute corridors to the Central Business Districts of Oakland and San Francisco. Consequently, most regular users of BART for the daily commute to work reported selecting BART for their commute trip in part because it is easier and more relaxing on the return home than the automobile.

Almost fifty percent of BART patrons use the automobile or carpools for access to BART on the work trips they regularly make on BART. Considerations of time effectiveness, cost, and relative comfort or strain all appear to figure into the calculated choice of BART for the regular work

trip. But this act of mode choice did not appear, at least in the first stage interviews, to lessen the exasperation BART patrons felt over the unreliability of BART service or their sense of harassment and helplessness during delays of the system.

She commented that during BART delays she feels helpless, especially if stuck in the tube. She feels "like a parcel on a conveyor line that is not moving. . ." (Castro Valley, single)

If he is in a hurry, being "trapped a captive of BART" is worse than being stuck in traffic, or a car which has broken down. (Commuter, family of 4, Orinda)

However, during the time span between first stage and second stage interviews, interesting changes occurred in some respondents' attitudes towards the delays and time efficiency of the BART system. There appeared to be a growing attitude of surrender and acceptance of BART (as BART) among most of its regular users. Users who in earlier interviews reported extreme irritation at the unreliability of BART and its impact on the planning of their time schedules, spoke in different tones in the second stage interviews. There appeared to be a growing attitude of toleration and indifferent acceptance of the BART trip as intrinsically unpredictable and potentially subject to varieties of changes in its schedules.

When asked how the unreliability of BART affected his routines, Mr. F. reported "dinner is late when I'm later and earlier when I'm early. . .my family flexes with my schedule. . .BART delays cost nothing. . ."

What seems most interesting is the apparent socialization of regular BART users into a special BART consciousness. Part of this consciousness is allowing for slack time in scheduling regular BART trips. Also, we find regular users reporting that they usually bring something to read so that BART delays don't really bother them too much. Along with this acceptance of the uncertainty comes a growing repertoire of BART "humor;" whimsical surrender before the uncertainty of BART's computer controlled system. Delays often bring with them joking and discussions of humorous BART mishaps which the regulars have experienced in the past.

"Oh, I got stuck in the tunnel once for forty minutes and this lady started weaving and, boy, you should have seen people move away from her. They got out of the way quick when it looked like she was getting sick." (Laughter from those around. . . .Concord bound rush-hour train)

Along with the acceptance of delays seems to come a change in one's sense of being harried by the race against that scarce commodity of time.

Using BART appears to encourage surrender in the continual war to maximize one's use of time. One middle aged regular BART user's responses and demeanor revealed the magnitude of this BART impact on his experience of time.

Respondent A. is a middle-aged Chinese American male. In the first stage interview he appeared to be a very direct person reluctant to waste words or time, anxious to be on his way, and restless about lost time or unnecessary steps along the path of daily activities. However, a marked change was apparent in talking to him in the second stage panels. He now seemed unhurried and expressed little concern about missing his usual connection with the Walnut Creek shuttle, where before he seemed understandably disturbed about the irregularities in BART's schedule, causing him to miss the shuttle which ran every half hour. He accepts that he will be late and doesn't worry about it.

Mr. A.'s reaction does not seem untypical. A large segment of regular BART riders are experiencing as a feature of their BART use an unchosen surrender to a system and a routine which changes the time, pace, and ambience of their routine travel.

However, while most persons learn to adjust to BART scheduling or change their transit mode, some newer users of the system still experience great frustration or they come to express extreme outrage:

Patron talking out loud on San Francisco bound Concord train. . . . "This system is f_----. . . . I give myself two hours to get to work on time. . . . Now, I can't even get out to call my boss to tell him I'll be late. By the time I get out and make that call, a Fremont train will come and I'll miss it. . . . This system is so f_----." At this point, the young man began hitting the side of the train. . . .

This type of reaction is exceptional but it appears to be consistent in substance if not in tone and emotion with the dissatisfaction with the system expressed by Phase I and a smaller part of Phase II panel members. However, some regular users remarked about the pleasant aspect of delays; their effect on encouraging people to talk to one another. Long delays appeared to our field observers to result in a real increase in conversations, particularly under crowded conditions. An increase in male-female interactions which might otherwise be bound by social protocols in the public space under smooth and reliable service conditions was also observed during system delays. These changes in orientation toward BART and BART delays seem to be only a smaller part of all changes

reported between the first and second stage panels. Much more profound seems to be the change in the sense of ease and relaxation felt by regular BART users.

Psychological Reactions to BART Use

Mr. K. could not articulate how different he felt from riding BART except to say he was "less tired; I used to be a basket case when I got home before. . . .I did not like the drive or the danger involved." (Orinda, family of four)

Riding BART has left Joe much more relaxed when he gets home from work. He now spends more time with his son and also meditates upon arriving home. The bus is stop-and-go and very upsetting. The relaxed ride was a "major factor" and consideration for staying at his present job. (San Francisco, family of four)

The return trip gives him time to "unwind and get things straight in my head. When I come home I'm ready to do the things I have to." (Single person, painter, North Berkeley)

Though his hours are relatively unchanged the few flexible minutes in the morning have made a difference. He no longer has to rush around the house to be ready for this ride which he "hated" to do. Now he eats breakfast, something he never used to do, and he feels more relaxed. He feels his wife enjoys his "not being so harried in the morning." He can sleep in once in a while, not being trapped by the car pool and this "means a lot." The evening ride doesn't mean that much. . . .He didn't have to drive that much when he was in the carpool so he was never too tense in the evening. (Orinda, family of two)

He says, "BART doesn't break down as much as people say." He finds the delays good for talking to other people in the train. He says he has been much more relaxed riding BART to work compared to the days when he used to drive. . . . BART spares him the trouble driving can cause. (Household of two, South Hayward)

BART: A Transitional Vehicle: Doing Work In Transit - Changes in Organization of Work

Working in Transit and the Creative Process

Any morning or afternoon during the daily commute period, one may notice riders reading journal articles, going through calendars and correspondence, or reading school or technical books. Fifty nine of the regular

BART work commuters in the panel report economies from doing work in transit.

He has found that, "I am able to arrange and order my work while riding BART into the city. . . ."

BART is a socially quiet space, a transition between the home and work worlds. The car may also serve as such a space, but only under conditions when one can control the pace of one's thoughts and images. During rush hour the mechanics of driving through congestion fully occupy one's attention. One does not have the option to reflect at length upon the day or engage in planning other activities. So, it is not entirely surprising that riders accept a loss of time on BART in exchange for freedom from the struggles and constraints of rush-hour automobile traffic.

Three of our 75 respondents reported meditating on BART on their way home. Two welcomed the opportunity to go over the day's experience at work. If it was a bad day, BART provided the opportunity to think about it and work it through. If working on an office related project, the rider may go over his notes and reflect upon the solution to a problem, read about new discoveries in his field in professional journals and go over correspondence. In the morning, one may conceive or review her plans for the day, organize the schedule of work activities, or simply prepare to enter the workspace.

A phone service installer reports going over the log of jobs for the day; a sociologist reads professional journals; an insurance man meets co-workers for conferences in transit; a lawyer reads specialized journals that usually get neglected at work or at home; an environmental specialist plans her day's work, sometimes riding past her destination to finish her preparation; a housewife reports paying overdue bills on BART; and students occasionally use the time for study, or for mid-term or final examination preparation. These small economies alter routines to provide a bridge between home and work which enhances the time available to adequately perform work tasks or other tasks and changes the subjective experience of elements of work.

A more frequent way of passing commute time is to read the daily paper, magazines and fictional books.

He likes to read. Time spent waiting on the platform in the morning is solely for pleasure reading, for which he would not ordinarily take the time. He considers this activity "positive" and looks forward to his daily commute knowing he will get to read. He "plans ahead, buying books."
(Family of four, Orinda)

During the morning ride he reads the newspaper. In the evening he sleeps or talks to people. (Single salesman, South Hayward)

Changes in the Organization of Work

Changes in the organization of actual work activities are less frequent than reports of work being done in transit. Yet, these more exceptional events (reported by 3 of 75 or 4% of the panel) indicate different patterns of work activities as a result of BART working in combination with other factors.

A Concord line businessman reports being able to move his office closer to home in Concord because BART makes Concord accessible to San Francisco; a freelance remodeler reports being able to get jobs in a wider area by using BART plus his bike to get to work locations; an East Bay patron reports BART makes it possible for him to work two jobs.

o Residence Location - BART Impacts On The Style and Location of Residence

Family Panel Reports of BART-Influenced Choice of Residence Location

<u>BART Influenced Choice of Location</u>	<u>BART Did Not Influence Choice</u>	<u>Total</u>
12	63	75
16%	84%	100%

"I lived in a city all my life so when we decided to move, we didn't want to be too far away from it. I can enjoy my environment and yet be in the city (Oakland) where I work within a half hour. It (BART) made a big difference."

"We moved (into a house we had built for us) anticipating the opening of BART (which was then delayed) and used Greyhound until BART opened. . . We decided to move closer to my job transfer and chose a place close to public transportation." Lafayette - Concord Line.

The Suburban-Urban Life Style

BART appears to have a clear impact upon the choice of new suburban residential locations. BART is experienced by a segment of suburban residential users as enhancing their chosen style of life. BART facilitates the combination of a good paying urban job with the comforts and secure neighborhood characteristics of suburbia. It is clear from the interviews that residential choices influenced by BART are likely to involve a number of other priorities in addition to availability of BART access. However, BART is perceived by a significant portion of the panel as an important consideration in choosing their place of residence. When we recognize that the 16% of the panel who report being influenced by BART does not take into account the persons who have made no choice of residence since the planned initiation of BART service, the potential range of BART impacts on long-term residential choices is closer to 20 to 25%. The issue of what percentage or part of the housing location decision is actually attributable to BART is difficult to determine. In our findings, BART is usually mentioned along with good neighborhoods, safety, a quiet, nice residential area, good schools and other indicators of perceived desirability. What is important is that BART serves to support the contemporary choice of suburban residence and urban employment, wherein BART replaces the car for the routine work trip with a more socially beneficial public transit mode. BART captures its largest percentage of the suburban-central business district corridor travel along the Concord line corridor. BART's share of Concord

line corridor to San Francisco commute travel is approximately 20% of all trips: (Transportation and Travel Impacts of BART: Interim Service Findings, 1976, Final Report).

BART also serves to establish broader contours of experience and freedom of movement for suburban youth. The parental contact interviews with parents of youthful BART riders revealed that BART has profound implications for the freedom of movement of suburban youthful users and for the relative independence of the youth and their parents. The enhanced freedom of the suburban housewife, freed from the requirements of chauffeuring her teenage youth, is the complement of accessibility BART provides for the youth.

While the Panel study and available land use data fail to provide an estimate of the extent of BART impact on residential choice behavior, the findings do indicate that BART has an influence on residence location selection along with other socio-economic factors.

BART is Perceived As Increasing the Market Value of Suburban Residences

Field interviews with residents in Orinda and other communities revealed that BART is perceived as contributing to the desirability and value of homes within the community.

"How much is a home like this worth now? \$80 or \$90,000?" ...

"Oh, no, our neighbors just sold their home for \$125,000.

Ours is probably worth that much because our lot is a little larger. It sure has gone up."

"Why do you think it's gone up so fast?"

"Well, people want to live near BART. Here, they can walk down the hill to the station." (Field interview with an Orinda CPA resident)

Conversations with Rockridge community residents also reflect a belief that BART has enhanced the value and desirability of the single-family homes in the area.

It is also clear that patterns of geometric rises in the price of single-family housing are occurring up and down the State. In desirable residential areas of Los Angeles, bank officials estimate the price rise during the period from 1974 to 1976 at \$1,000/month (Daily Commercial News, San Francisco, California, Vol. 196, No. 40, Nov. 30). However, what is significant in the Bay Area is the impact of BART upon the definition of desirable residential characteristics. The suburban residents who see BART influencing the value of their single-family homes are primarily one and two-car families. The desirability of BART is not linked to transit dependence but to a perceived choice of not having to drive to work. These persons are not regular public transit

users for other routine purposes. Thus, BART is influencing change in the meanings which define what is desirable in types of residential life styles. Whether or not BART is objectively responsible for a rise in the value (as measured by relative sales prices in comparable BART and non-service areas) is not the major point here. Rather, if BART is perceived as important in defining residential desirability, then this construct will influence future definitions of residential desirability. Traditionally, upper income areas have had their perceived desirability linked with auto accessibility to and from single-family homes.

o BART Impacts Upon Recreational and Leisure Activities and Experience of the Public Space

The Oakland Coliseum

The G.s have taken BART twice to the Oakland Coliseum for sports events and enjoyed using BART this way. If it ran later at night, they would use BART for dinner or dancing outings in San Francisco. (Family of 2, 2 cars, Hayward)

Mr. and Mrs. J. drive to all events except they use BART to the Oakland Coliseum. It eliminates problems with parking and BART is safer than the buses. (Family of 3, 2 cars, San Leandro)

I. has gone to the Coliseum twice on BART. He thinks he probably would not have gone at all if it were not for BART. He prefers to go to most recreation (night clubs, movies) by car, especially if on a date. (Single, 22, 1 car, Berkeley)

The Oakland Coliseum, home of the Oakland Athletics, the Golden State Warriors, and the Oakland Raiders is the one recreational destination within the BART service region for which there is clear evidence of BART use in the Family Panel interviews, the Field Contact interviews and other transportation studies of the Bay Area population (see for example, BITS-2, 1975). Most persons report using BART to the Coliseum because of the ease and convenience of the BART trip compared to the problems of driving and parking at the Coliseum complex. Particularly, leaving the parking area of the Coliseum after an event presents problems of traffic back-ups and delays.

BART data on exits from the Coliseum station during August 1976, provide a good picture of the extent of BART use as an access mode to the Coliseum. The most well-attended events, the Day on the Green Concerts, appeal to Bay Area youth, the most recreation and BART oriented of the potential recreation markets. While it is apparent that BART also draws some of the trips to events, such as Lawrence Welk, which appeal to an

older set of patrons, the greatest use of BART is for regional athletic events, rock concerts or other events that cater to younger riders. The BART Bay Area Awareness Study (1976) reveals that the Oakland Coliseum is the most widely recognized landmark destination served by BART, with 90% of the riders and 62.8% of the non-rider populations expressing awareness that it is a destination served by BART. There have been limited BART promotions for the various athletic events at the Coliseum, with a larger and continuous promotion for the Golden State Warrior basketball games. On most evenings of Warrior or Oakland Athletics games, the Coliseum station is full of patrons right before game time, and BART has occasionally placed extra trains on the system to handle the load. During a recent promotion, an additional five cars (1080 passengers at a 2:1 load factor) were still not adequate to carry the Coliseum patrons. (See Table #9 on page 51.)

Other Recreational Uses of BART

Research findings from both our Field Contact and Family Panel interviews suggest that the most frequent recreational trip purposes involve somewhat non-specific trips to the Central Business Districts of San Francisco and Oakland. These trips involve outings which combine the opportunity to go downtown and sightsee, dine out and meet with friends or go shopping as a recreational activity. This non-destination-specific type of recreational outing is the main area where there appears to be a large latent demand for BART use during the weekend. Table #7, which reports BART use by Panel members' household size, reveals that non-work trips are most frequent among our panel members for single, two-person and three-person households. These figures reflect in part the facts about leisure life routines. Single persons in the panel report taking more recreational and visiting trips by any mode than the larger family households. This is more a reflection of their position in the life cycle and the effects of household formation on the structuring of life routines than of transportation related impacts.

From the findings under interim service it appears that BART use for non-specific shopping and recreational trips is more than a substitute mode for a trip normally taken by other modes. BART use appears to stimulate new types of travel for some respondents. For most panel members the very use of BART appears to subtly mold and transform the quality of the trips in themselves. The fact of being thrust into the public space without the route definition of the automobile appears to change shopping and sightseeing trips into more open-ended recreational outings.

Holiday Service and Special Recreational Promotions

In an effort to stimulate non-routine uses of BART, BART has organized a number of special holiday promotions, (e.g., Labor Day, Thanksgiving)

TABLE 10

**COLISEUM STATION PATRONAGE
BY RECREATIONAL EVENTS
AUGUST, 1976**

DATES	COLISEUM PASSENGER EXITS	TOTAL PASSENGER EXITS	% OF TOTAL SYSTEM EXITS	COLISEUM SPECIAL EVENTS
8/2	1689	130,601	1.3	No event
8/3	6979	141,928	4.9	Day on Green 6 (Eagles) (Rock Concert)
8/4	1836	132,187	1.4	No event
8/5	1809	132,232	1.4	No event
8/6	2343	132,741	1.8	A's (baseball game)
8/9	1840	133,061	1.4	No event
8/10	2586	134,435	1.9	A's, Gaters (Pro Tennis)
8/11	2094	130,948	1.6	A's
8/12	2114	131,226	1.6	A's
8/13	2717	133,759	2.0	A's, Gaters
8/16	1787	132,447	1.3	No event
8/17	2241	132,076	1.7	Gater Playoff
8/18	3328	129,422	2.6	Day on Green 7 (Jethro Tull) (Rock Concert)
8/19	1731	130,583	1.3	No event
8/20	2573	133,922	1.9	Lawrence Welk
8/23	2071	129,352	1.6	No event
8/24	2473	131,779	1.9	Ringling Bros. Circus
8/25	2975	133,453	2.2	Circus
8/26	3213	133,503	2.4	Circus
8/27	3547	131,392	2.7	Circus, A's
8/30	5954	136,655	4.4	Circus, A's

AVERAGE DAILY PATRONAGE: July 1976 – 1,960

Source: Bart: Data Acquisition System (DAS)

and special publicity for other recreational events, (e.g., the circus, the symphony, and Warrior games).

BART reports on Labor Day patronage, in addition to our own survey of the Labor Day travellers on the BART system, suggest a latent demand for utilization of the system as a recreational vehicle. On Labor Day 1976, there was a uniform special 25¢ fare for travel anywhere on the system. In addition, there were frisbee contests attended by frisbee champions at the parking lots of four stations. Ridership for that day was estimated at 150,000 patrons, considerably higher than the usual 130,000 patronage and without the usual work trip market. Part of this patronage was stimulated by the distribution of 39,000 complimentary tickets of which 18,000 were used.

There remains some question about the relative elasticity of the latent demand for recreational use of BART. However, the expense of using BART for group trips and the lack of weekend service are the most consistent reasons offered for non-use of BART for recreational purposes, in addition to concerns about feeder access and convenience relative to the automobile.

Basically, J. likes BART. He finds it expensive and would like to see the price come down and extend to weekend service. He said he would "go out of my way to use BART because I dislike driving." He also said if BART ran on weekends, he would still drive to go visiting because of the cost for three people (himself, his wife and their daughter). He would like to see a lower fare for families. (Family of 3, 1 car, Concord)

He has gone to the Coliseum for sports events and would go on weekends as well as weeknights if BART ran. He would use BART a lot if it ran on weekends. Weekend service, more convenient parking, more trains during rush hour and less headway are improvements he would like to see. (Single, late 30's, South Hayward)

She wishes BART ran on the weekend because then she would go into downtown San Francisco, which she loves to do. She does not go to San Francisco very often because she hates to drive there. BART service would give her the chance to go. (Family of 2, 2 cars, Richmond)

The success of the Labor Day promotion suggests to our research team the possibility of greatly expanded BART recreational and leisure use if BART is running under full service operation (weekend service), and if a reduced or differential fare schedule is implemented for certain time periods (weekends and off-peak). This type of change would appear likely to generate new and more frequent recreational trips among Bay Area users.

Life Style Implications of Recreational Patronage

There was extensive promotion by BART of a "BART goes to the Circus" campaign for the Ringling Brothers Circus at the Coliseum. BART reports a ridership of 8,191 for five days of Circus dates at the Coliseum. What is significant is that the group character of the Circus crowd, and to a lesser extent of regular Coliseum BART patrons, is substantially different from the usual BART patronage.

From our own field observations and contact interviews, it is clear that BART patrons travelling on Labor Day, to the Circus, and to other Coliseum events are primarily travelling in groups while most regular BART travelers (over 85%) report travelling alone. The groups for the circus trips were usually one or two parents travelling with one or more children. Contact interviews (50) suggest that these travellers comprise a combination of regular BART users, occasional users of the system, and new users. However, most of those travelling to the Circus by BART whom we interviewed reported that without BART, they probably would have come to the Circus by car.

The Bay Area Awareness Survey reveals that for the region as a whole, recreational trips constitute the most frequently reported BART use. Of the 75% of the population who report ever having used BART, 45.7% report having used BART for recreation, whereas 29.2% report having used the system for work or school trips. But this recreational usership is still very infrequent. BART also conducted field contact interviews with 276 Circus patrons. They found that 76% were infrequent users of BART. What the data suggest is that there is a large reservoir of occasional BART users whose primary experience of the system is for recreation or leisure purposes, but that these users do not ordinarily travel on the system. This data is confirmed to some degree by the Passenger Profile Survey of evening BART travellers, among whom 5.4% report recreation or entertainment trip purposes.

BART Impacts on Regional Cultural Activities As Facets of Recreational Routines

He often goes to plays, symphonies, and restaurants during the week using BART for transportation rather than driving. He goes to the Oakland Symphony specifically instead of San Francisco because he can get there by BART (Single, 30s, 1 car, East Bay).

Mr. C. is recently retired and commented that he is still adjusting to all his free time. He rides BART or the bus to the American Conservatory Theatre rehearsals, depending upon what is most convenient. Other than that he doesn't go out much. (Widower, no car, San Leandro)

Mrs. W.'s use of BART is a combination of recreation and visiting. Once a week she goes to the Opera House in San Francisco where she ushers and gets to see concerts for free. She also visits with her friends who work there. She could do none of this without BART. She drives, but the parking is prohibitive. (Single, retired, one car, Concord)

The Family Panel and Field Contact interviews and the BART Passenger Profile Survey all suggest that use of BART for travel to recreational and cultural events in the city centers of San Francisco and Oakland is not a prominent feature of present BART use. However, the Panel reports included above also reveal that BART availability makes a real and tangible impact upon the life routines of the small group of persons with limited transportation choices. In a limited number of cases, BART makes possible excursions to regional cultural experiences that would not otherwise occur.

This view is supported by findings from the Youth Contact Interviews. Four of the youth we interviewed used BART to travel to San Francisco Boys' Choir rehearsals. And, on checking at rehearsal, we found that half of the Boys' Choir sometimes use BART to travel to the rehearsal. A significant segment of the Choir members' attendance at rehearsal would be practically impossible without BART. Thus, BART facilitates the participation of regional youth in the regional cultural activities.

BART's Oakland 19th Street station is near to the Oakland Paramount Theatre, home of the Oakland Symphony and location for a variety of pop, rock and jazz concerts. Field observers at the 19th Street Station found the station area crowded for some events and relatively uncrowded at others. A study of its larger life style impacts as related to these events would be appropriate under conditions of full service.

The San Francisco Symphony, Opera, and ACT (American Conservatory Theatre) are all accessible from San Francisco BART Stations less than three blocks away. Field observation suggests that ACT draws a larger percentage of BART users than the other regional activities. Again, field observers report full station areas during these events, while on-train observers report 20 to 30% of the ridership of some Concord-bound cars are returning patrons from ACT programs from the afternoon matinees. However, Family Panel interviews suggest that these types of recreational pursuits are not frequent features of routine life activities. At best, we may expect that under full service conditions, BART will facilitate attendance at these events by persons with limited transportation choice. For others it may make a trip ordinarily taken more pleasant and thereby stimulate more frequent participation in the cultural activities of the region.

In addition to looking at the BART impacts upon regional and central city recreational locations we also conducted field interviews and field observations to determine if there have been any impacts upon the proliferation of recreational activity around local neighborhood centers and recreational facilities close to BART stations.

BART Impacts on Local and Neighborhood Recreational Routines

An approximately 30-year-old was riding the Concord-bound train. He was wearing a blue exercise suit and carrying his tennis racket. He was heading from Oakland to Lafayette to play tennis in the public courts there. He finds the courts there superior to the Oakland public courts and they are usually not occupied. (Near Rockridge Station)

A young man was encountered on the Fremont-bound train in his exercise suit. When asked where he was going, he said he was "going to Lake Merritt to run around the Lake."

Field contact interviews and observations reveal limited BART impact upon local recreational pursuits and non-routine shopping by consumers in the North Oakland, Berkeley and Oakland 19th Street service areas. There is no evidence of significant BART impacts upon localized recreational and leisure routines. Even in the area of non-routine shopping and window shopping, field interviews with proprietors of small shops close to the Rockridge Station where there is some appreciable foot traffic (primarily antique shops and boutiques) did not lead to reports of a flow of new persons into local shops via BART. Patronage of neighborhood shopping and recreation locations appears to remain car or bus-centered, with some walking trips from residences nearby.

The BART Excursion: Sightseeing in the Region - BART As A Facet of the Regional Terrain

The only recreational use is made when family and close friends of the M's come into town. The M's like to take people out on BART rides to show them the system. (Family of 4, South San Francisco)

About half of the Family Panel report taking friends or relatives out on BART for sightseeing tours of BART and the region. In spite of complaints about the unreliability of the system, BART is viewed as a new technical form of sufficient marvel and regional import to be the occasion for a tour when visitors pass through town. This finding serves to confirm a view which sees BART as a source of transformation in the regional life style. Particularly during the summer months,

field researchers report a large number of out-of-town visitors in groups on the system. There is no accurate measure available for the extent of tourist use of the system during this summer period. Some indication of the level of tourist use is suggested by the fact that system patronage remains relatively constant during the summer months when work vacations, and school and college recesses or reduced sessions are scheduled. School and college trips comprise 12% of all trips during the May period of the Passenger Profile Survey. It seems reasonable to assume, given our field observations, that a significant portion of this segment is replaced during the summer months by tourist excursions in the area. As such, BART use is often combined with rides on the cable car, and less frequently, with trips to the Sausalito ferry. BART contributes to visitors' experiences of regional transportation modes of a distinctive character, one more unique feature of our tourist-dependent region.

BART and the Public Space: Attitudes About the Safety and Security of BART and Other Transit When Travelling in The Public Space

The C's have ridden BART in the evening when returning from business dinners. They expressed no fears and enjoy having BART available for this. Mrs. C. rides over in the evening alone to meet Mr. C. and there is no problem with this, but they would not ride the bus, ever. (Family of 3, Alamo)

The S's don't go out much. They have ridden BART together after visiting friends in Berkeley and felt perfectly safe. Mrs. S was once on an AC Transit¹ bus and felt a little ill at ease. (Family of 2, Fremont)

One area of concern in the Family Panel interviews was the effect of BART upon the relationship of BART riders to the public space. We were interested to see if BART would have any effect on the level of street traffic and social activity around the streets and public facilities of the downtown areas. Also, we wanted to determine whether BART and the process of street beautification which accompanied its development (new sidewalks, landscaping, benches, etc.) would begin to change the way people experience the streets and public facilities in the downtown areas, particularly during the evening hours. There has been a historical evolution in the metropolitan areas of the United States away from integrated community lives, which involve a balance between private home and private associational activities and some participation in a public life. In most central districts of the country, with the increasing majority settlement of suburbia, and as the ethnic neighborhoods have broken down through assimilation or similar migration to the suburbs, the public life has become more sparse. Music, concerts, plays, bars and nightclubs within the central cities have become less populated. The clientele which remain at these establishments thus increasingly

¹ Alameda-Contra Costa Transit District serving the East Bay.

become central city residents plus a small number of single young people from outside the city.

When we contrast the public life in the Bay Area or other metropolitan areas in the United States with that in other countries, we see that the public life in the United States cities is dying. In the larger cities of Europe, Italy, Spain, England and the Soviet Union, the transit system is close to main boulevards and the public institutions of cultural and recreational entertainment, and this serves to bring nightly clientele to the boulevard cafes, nightspots, and evening cultural and recreational activities. While the more economically prosperous countries (e.g., France) are experiencing some decline in consumption in the public space as worker incomes and the development of private home pursuits rise, they still possess relatively active nighttime spheres of mingling public activities.

Our research sought to address two issues: Does BART impact upon the perception of the public sphere? And, what is BART's present and potential impact upon the revitalization of the public space?

It is clear from the panel interviews that BART is experienced as being more pleasant and safer than AC¹ and MUNI² buses.

J. does not mind travelling at night by car or BART. He feels BART is "very safe" for this. He favors BART over the bus which he feels is unsafe.

However, for most car owners in the panel the issue of safety on public conveyances is not in question. They always travel in their cars at night. The car is experienced in part as a protection against unknown dangers in the public sphere.

For travelling together the B.'s go by car and are not hampered by any fears. (Walnut Creek household of 2)

Jackie has no fears of going out at night. She is always with "escorts" and they travel by car. (Mission-24th Street, single person)

The P's would "rather be home at night." When they do go out they travel by car. They have never ridden BART later than 5:30 p.m. and do not ride the bus. They "do not like walking on the streets at night, because you never know who you will meet on the streets." They usually park within a one minute walk of where they want to go. (Family of 2, Lafayette)

¹ Alameda Contra-Costa Transit District (A.C. Transit)

² San Francisco Municipal Railway (MUNI)

The Passenger Profile Survey of evening travellers on the system shows them to be disproportionately young and of lesser incomes as compared with morning peak travellers: 35% of evening travellers report incomes under \$10,000 compared to 23.6% of morning peak travellers with incomes in this range. The evening travellers are also slightly younger, with 68% of them under 34 compared to 60% of the A.M. peak travelers.

He doesn't have much choice about transportation so he can't afford to be afraid of night travel, otherwise he would go nowhere. He feels BART is safer than the bus and gets a ride with a friend when he can. (Single, Oakland)

The meaning of the BART alternative for those who lack automobile access is clarified by one panel member's responses in the first and second panel interviews. In the first interview Ms. M. reported that:

She rides BART to attend Sufi meetings in San Francisco. She and her roommate go and if BART did not run in the evening they could not go. She feels that BART is much safer than AC Transit because "it isn't waiting at the bus stop." (Household of 2, Berkeley)

It is clear from her comments that BART makes travel into the public space during the nighttime hours a more secure and less threatening experience. However, when interviewed several months later Ms. M. offered the following report on her BART-related travel activities.

She still rides BART for recreation or to attend meetings at least once a month. But she bought a car since last interviewed, so does most of her recreational activities by car now. When asked if she still felt safer on BART at night than on the bus she reported it wasn't a concern because she now had a car. (Single, Berkeley, household of 2)

This succession of interview responses confirms the pattern apparent in other panel responses: the public space does not become a real concern as long as car access to and from the nighttime destination is conveniently available.

Does BART Presently Impact Upon the Experience of the Public Space?

The very fact that regular car-using suburbanites are willing to travel on BART at night though they consider the bus an untenable nighttime travel mode suggests a limited BART impact on the public experience. This impact is indirectly supported by the relatively large number of upper income persons (\$50,000 a year or more) who ride the system during the night hours. Passenger survey data reveals 4.3% of the nighttime travellers reporting incomes in excess of \$50,000,

compared to 2.2% for the A.M. peak period. Their selection of BART over other modes represents a BART impact on the meaning of public transit and public exposure for this demographic sub-group.

The more profound BART impact on the experience of the public space occurs for persons with limited transportation choices. For them, BART is perceived as more pleasant, more comfortable, safer, and less populated by strange or rowdy persons. These findings along with some direct reports of BART facilitating and/or making possible nighttime recreational activities, suggest the present scope of BART's limited impacts upon travels into the public space, and a positive impact on the sense of safety and security for nighttime public transit users.

However, BART's present lack of weekend service and its relatively early nighttime closing time seem to constrain impacts of larger magnitude on recreational travel and experience of the public space. The BART nighttime schedule presently discourages some nighttime travel. The inconsistent closing time for the last BART train from 11:20 to 12:56 p.m. depending on the location of one's return trip station seems to create feelings of uncertainty and insecurity about becoming stranded during night travel. A later closing time is necessary to provide a sense of security about completing the return trip and to fit the time frame of activities of the most frequent recreators, younger couples and single people.

o Visiting With Family and Friends - BART Influences on the Visiting Patterns of Specific Population Segments of BART Riders

BART Impacts on Family Visiting

BART impacts on family visiting are very limited. The regional dispersion of family ties is the backdrop against which to evaluate BART impacts on family visiting, but most people in our sample did not have family ties in the BART service region. Moreover, for most persons with family ties close by, BART was perceived as virtually irrelevant to family visiting.

They have various family members with whom they visit regularly. He has a sister in Westlake and Mrs. X's mother lives on 40th Avenue. She visits her mother once a week, and they also visit family in Saratoga every few weeks. "We drive on all these trips because there is no better way to go."

Family visiting traditionally occurs during the weekend and evening time slots. BART is not available on weekends and is usually not perceived as an access alternative for weeknight trips. Additionally, respondents comment that BART is too expensive for more than one person in a family travelling together. If the whole family is going somewhere (i.e., to visit relatives) then "the car is much more economical."

When evaluating BART's impact on family visiting, it is important to appreciate the relative unimportance of family visiting as a regular feature of most panel members' ordinary routines. For the majority group members in the sample, the patterns of segmentation and separation of kin that accompany the socially and economically mobile middle class lessen the importance of family ties and family visiting as regular features of their routine lives. While family may hold an important emotional place, family relationships and visiting are not regular hubs of social activity.

Ethnic Families and BART

The social nature of American society is such that the processes of employment and consumption tend to democratize and homogenize the activities and pursuits of formerly divergent class and ethnic life styles. Handel and Rainwater (1964) among others, talk about the emergence of a modern working class where working class life styles and working class values appear to merge toward the characteristics of the middle class. The facets of this pattern tend to be suburbanization of home residence (leaning toward home ownership), increased focus on the nuclear family, including segmentation and separation in the relations with extended family kin, and the development of consumption desires which tend toward the concerns and activities of the middle classes. Aspects of this trend are apparent in the Family Panel interviews with blue collar families. Nonetheless, a substantial segment of our interview panel of blue collar households were ethnic households who demonstrated very different patterns of family visiting from those of white majority group families.

Among Latinos and Asians, family visiting is described as a regular feature of their routine life activities. There is some divergence from this pattern among the black families interviewed, but the place of family and family visiting appears to be somewhat more prominent among all ethnic family groupings than among whites.

Given this decisive variation in the life style orientations of ethnic family members, the question arises whether differences also exist in the relationship between ethnic family life styles and BART. BART does influence and alter the family visiting patterns of a sub-segment of the ethnic families within the Family Panel. For ethnic families with two cars and two adult drivers, the choice of the automobile as the vehicle for family visiting and family trips tends to parallel the mode choices of the majority group families. However, BART enters the routines of older ethnic family members, non-drivers, and younger single persons with limited car access as a facilitator of increased family visiting and increased ease of travel for family visits which might have been taken by other modes. A middle-aged Chinese American householder and non-driver offers an example:

A. rides BART every other week to downtown San Francisco for shopping. This activity is more frequent because of BART. The trips to downtown often include a stop in Chinatown where A. visits her sister. She gets to see her more often because she is able to get to the city more.

Where ethnic family members are not regular drivers, BART re-enforces and supports a life style orientation toward family visiting. In another case, a middle-aged Chinese American respondent takes BART to Pleasant Hill Station where her sister picks her up. Before BART, there was no easy public transit connection between them. So the visits had to wait for a time when another friend or relative could drive the respondent to visit with her sister. The variation in ethnic family visiting patterns does not, however, alter the general preference for car travel and weekend trips for routine family visits. It is only for the non-drivers that BART becomes integrated into their weekday routines as a facilitator of increased frequency and ease of family visiting.

BART and the Family Visiting Patterns of Youthful BART Users

One exception to the observed pattern of limited impact on family visiting is the influence of BART on nuclear family visiting through its creation of new transportation alternatives for youthful users.

H's daughter (9 years old) rides BART quite a bit. Often she rides into Montgomery station to meet her mother for lunch.

While we found only limited mention of use of BART for meetings between youth and their parents in the adult Family Panel (2 cases out of 75), the use of BART for nuclear family visiting was revealed as a fairly routine youthful pattern of BART use in our Youth and Parental Re-contact interviews. As discussed in greater detail in the Youth segment which follows, BART does serve to facilitate visiting, and relationships among youth and their nuclear family members which would otherwise be difficult or impossible to sustain with the same frequency. Six percent of our spring youth BART user respondents report using BART to visit with their separated parents. This pattern of BART impact on familial visiting is consistent with observed BART impact on adult family visiting: for non-drivers with limited travel options, BART is a facilitator.

BART Impacts on Visiting with Friends

Visiting and Ordinary Routines

For most members of the Family Panel visiting is not a frequent activity among their regular travels. But when they do go visiting, the automobile is the preferred mode. The visits ordinarily occur in the

evening and weekend time slots. For evening travel to visit friends, BART is perceived by people (in part objectively because of its limited system characteristics) as inconvenient and not travelling where they want to go. It is also perceived as closing too early for evening visits where one might want to return later than midnight. Among persons who have a car available, the automobile is felt to be the most convenient, safest and most secure way to travel for evening trips. Consequently, for car users, convenience of route and flexibility of destination, combined with the perceived security of the car for evening travel, all work to support a pattern of car use for most regular visiting.

The Exceptions: Younger Adults, Single Persons, and Some Non-Drivers and Shopping With Friends

All of her friends, except for people at her church, are in Oakland where she used to live. She goes to Oakland about three times a week, on the average, to visit them. She takes BART and could not afford to take Greyhound. If it were not for BART she would be pretty miserable as she would be stuck in Concord where she knows no one. (Retired, single person, living in Concord)

For non-drivers in the Panel, BART is used occasionally for visiting with friends. However, the problem of the flexibility of the route which BART effectively serves and the time limits in its interim service period tend to constrain non-driver visiting trips as well as those of drivers.

J. visits friends that are within 10 miles. He will take BART if he is going in the evening and the bus if he visits on weekends. He doesn't have much choice about transportation so he can't afford to be afraid of night travel, otherwise, he would go nowhere. He feels BART is safer than the bus and gets a ride with a friend if he can.

The lack of desire among non-drivers as well as drivers to travel in the public space during the evening hours influences people to stay at home or seek rides with friends rather than travel by BART on their visiting trips. The level of visiting via BART is highest for single, younger, adults, who lack car access. Among this category of persons who go out more frequently than larger households, a visit with friends is often combined with a trip to cultural or entertainment locations in the Central Business District area of San Francisco. A trip by BART which goes to the theatre or restaurant and to meet friends is perceived as a good travel option by 3 or 4 members of the panel. But BART does not appear to have a very tangible effect on increasing the frequency of visiting.

The Triangular Trip

One area where BART does appear to alter the visiting routines of adult panel members is in its stimulation of triangular trips in connection with the work-home commute via BART. Single adult BART users report using BART to go visit friends after work before returning home. BART, with its close access to work locations, is used to travel, to visit, or to combine a visit with shopping or going out in the downtown area. This use of BART for triangular trips was also observed in the college student interviews. It is probably more a reflection of the life routines of single, primarily younger adults than an indication of BART impacts on the structuring of life styles.

o Scheduling and Style of Routines

Re-scheduling of Household Routines - Regular Users

Mr. M. must leave earlier in the morning but he doesn't mind because he uses the time to read. He gets home 20 to 30 minutes later in the evening, and where he used to putter around and do house things, he now walks in, says hello, and sits down to dinner.

Many of BART's impacts on daily routines may be too subtle to detect at this point in time. The extent of adjustment of daily routines to this new mode of transportation may be more profound when BART is running under full service conditions. BART is still new to the area, and within suburban areas, it is also new to most of the population's general concept of transportation. These people understand car and transportation to be synonymous and inseparable. For those who have been willing to learn how to use public transportation regularly, BART has forced a whole set of accommodations in their daily lives. Sometimes these adjustments may be as small as making a ten-minute earlier departure in the morning and arriving home fifteen minutes later in the evening, or they may involve a re-scheduling of the work time frame an hour earlier or later. What becomes clear in the panel interviews is that riders are generally making these adjustments in their routines. However, respondents are ordinarily unable to note any differences in their activities or those of their families which accompany these shifts in the scheduling of regular (primary) work trips. The adjustments are either too small or have become sufficiently integrated into the family routines to become experienced as normal. As the new normal, they are not necessarily even experienced as external factors causing adjustments in the complimentary scheduling of the routines of the household.

There are some infrequent exceptions to this observation. One respondent reported returning home earlier on some days because of the greater speed of the BART rush-hour commute. On these occasions, he would start

dinner instead of waiting for his wife to come home and start it. However, BART's irregularity eventually led to this user's abandoning it. The variation from being earlier than usual to later than usual caused havoc with his sense of predictability and the regularity on which his and his household's routines were founded. This exception provides insight into the general case. Regular users of BART do generally adjust their schedules around their BART use. This re-scheduling is the norm rather than the exception for most regular users. Adjustment in work-related household routines is BART's primary impact on the scheduling of routines. As suggested in the section on work-related impacts, this effect is connected to larger changes in the riders' relationship to time and their sense or lack of control over their routines. BART travellers are spending more time travelling and as one respondent said, "living with it."

However, not all time adjustments require the investment of additional time for travelling which would otherwise be used for different purposes. Some Concord line and Fremont travellers report real time savings, although they are not always able to integrate these time savings into new routines, because the trip travel time still varies too much.

BART Impacts on The Scheduling of Routines in One-Car Families

Because they have only one car Nina and her husband trade off using the car and BART. The one who can use BART the easiest takes it. In the morning they arrange who will ride BART according to what they have to do that day. (Fruitvale, family of three)

A lot of coordination is necessary in this family because they have only one car and live on top of a very steep hill. BART makes possible more freedom in their family routines because now that Mr. K. rides BART to work, the car is left home for his wife to use. (Lafayette family of five)

Mr. R. always used to drive or his wife would drive him to work. Now he switches between BART and driving. His wife takes him to BART the days he takes BART. He never takes the car and leaves it at the station until he returns from work. This way his wife can have the car on most days. The days he works the late shift he drives. (North Berkeley, family of two)

BART has a clear impact upon the scheduling of complementary routines in one-car families where one or both adults work. For some one-car families BART establishes greater freedom for the housewife because she now has a car available during the day. In other cases, where both adult members work, BART use incorporates the need to co-ordinate

their daily routines. Two housewives in the sample represented a third type of case: they reported irritation at having to drop off and pick up their husbands at the BART station. The irritation appeared to stem from the unpredictability of the evening arrival time for a regular trip. One mentioned the particular difficulties of going to pick up her husband just when she is in the middle of cooking dinner. In general, however, BART appears to enhance the freedom of family members by encouraging complementary routines which facilitate the freedom of movement of family members. However, even in cases where new freedom was reported, Panel members had difficulty in reflecting on their situations and reporting how BART had actually changed their routines.

Some households did report potential financial savings because they were able to negotiate their routines without the need for another car. However, concrete changes in their lives which follow from BART accessibility or the indirect financial savings it provides, were not clear from the interviews. Some changes do occur but users have difficulty identifying these changes, or reflecting on the meanings of the shifts in their routines.

Scheduling of Routines in Transit-Dependent Households

Single persons with no or limited car access generally report re-scheduling their shopping, visiting, and recreational activities around BART access. Single-person households do not confront the complementary scheduling demands of other family members which constrain their freedom to creatively re-organize their routines. In particular, they mention taking shopping and visiting trips during the week which would ordinarily be taken during the weekend time frame. For single respondents, this adjustment in their routines often takes the form of taking new triangular trips. The triangular trips involve a shift in activities by adding visiting or recreation side trips on the way home to their regular BART work trip. The existence of the BART system appears to stimulate a drift into new or more frequent trips for those persons (primarily single-person households).

Evaluating the full extent and significance of BART's impact on the scheduling of people's routines will require investigation over a longer time frame and under conditions of more extensive (weekend and later night) BART service.

o BART Impacts on Public Transit Use - BART's Impact on the Place of Public Transit in Life Routines of Panel Members

Buses and BART play a big role in Mr. D's social life. He has no friends who live close by his dwelling so he finds himself commuting between Hayward, San Francisco, Berkeley, and Oakland where he lives to visit friends.

He estimates that he uses BART two times a week to visit friends. These trips occur in the evening and would take place on the weekends if BART ran then. On the weekends, he is forced to use buses and he deeply resents that BART does not run then. (Single, 37, no car, low income)

J. hates the bus and prior to BART, she was confined to bus riding. If BART ran on weekends, she would use it then and consequently, go more places. (Single, no car, low income)

He knows how far every place is from a BART stop and uses BART as much as he can. He said the Oakland Coliseum is the only place that BART has substantially changed his relationship to, that he has gone there more since he could get to it by BART. (34, second generation San Franciscan, car owner)

Car owners and persons who are dependent upon public transit both provide insight into the limitations of BART as a new facet of public transit and as a facilitator of greater utilization of public transit modes. Both car users and transit-dependent persons identify four areas of constraint upon their taking more and different types of trips by public transit. The four areas of expressed constraints on greater BART use are:

Inconvenience and Unreliability

Lack of reliability and its limited service area render BART impractical for much travel. Car owners argue that public transit must become more convenient in order to draw them out of their cars for other than work trips or special trips to Central Business District areas. Public transit users are unhappy about the limited character of BART service but make adjustments in their scheduling of activities and accept longer wait and travel times as facets of their travel experience.

"Public transportation means spending a lot of time travelling. . ." (Single, no car, Oakland-17th Street)

Since selling her car, she has learned to give herself a lot of time to get to places and to always carry a book. The process of getting to a place and the means of getting there become part of the experience. (Female, 40, family of four, no car)

We find regular commuters with car access working toward similar adjustments in their attitudes toward BART travel time along the trip to work. However, they consider that the non-reliability and particularly

the wait and transfer time of BART use render BART an unthinkable alternative to their cars for non-work trips.

While both regular public transit users and automobile users who commute via BART see similar objective service constraints, the meanings they attach to these characteristics and their resultant behavior varies in accordance with the alternatives available to them. The wait, travel and transfer time which are untenable and impractical for the car user are within the realm of the possible choices for the transit-dependent segment of the panel. Nevertheless, regular transit users may de-select BART because of the unreliability of its service compared to A.C. or MUNI service characteristics.

These decisions may include adjustments to use BART only part of the time because of its perceived superiority in non-access characteristics:

She has worked at this firm for a year and a half and before using BART used A.C. Transit both ways. When BART first opened, she rode it both ways, but there were so many delays that she decided the only way to be assured of getting to work on time was to use the bus. She returns from the city by BART because BART is "easier."

Within the area of the availability and timing of feeder access, we are dealing with objective characteristics of a transportation system. However, these objective qualities have different behavioral consequences and differing priorities of importance for different segments of the panel. For the regular automobile users in two-car households, these feeder characteristics generally help explain why the user drives to the BART station and why BART is not employed for a wider range of trip purposes. For the household with one car and a number of travellers, the feeder service constraints may mean an earlier return home (e.g., Fremont buses stop at 7 p.m.) or the need for another family member to drive to drop off or pick up the BART user. But, regular users with car access do view better feeders as potentially facilitating BART use without the automobile:

Mr. T. felt that if BART had better feeder lines, people would use it more. He would like to see shuttle buses in every community so that people would not have to drive to the parking lots. (Moraga, two cars)

However, the absence of feeders does not significantly alter these travellers' life routines or their patterns of BART use. Routine BART use and the availability of their cars insulate them against feeder service impacts affecting the planning of their routines, although they may have to leave earlier to make sure that they get a place to park in the crowded parking areas along the suburban periphery, particularly along the Concord line.

In contrast, transit dependent persons must orient their lives and their routines around the constraints of BART, bus, and feeder availability:

In Concord, the only buses are BART feeder buses and Greyhound. Aside from BART, Greyhound is her only way to get around, and the Greyhound is too expensive for her low income. She learned about the senior citizen's discount from a man at her church. She must plan her trips around BART and the feeder buses. She was wishing that the feeder buses ran on Sunday, if only once every hour. (Female, 67, retired, no car)

On the peripheries of the Concord line, the once-an-hour feeders are the only available public transit for persons without cars who don't want to rely upon being driven by friends or relatives.

BART Service Hours - The Lack of Weekend and Late Night Service

Mrs. S. thinks "it is stupid that BART doesn't run on weekends." (Family of two, Fremont)

Those persons most likely to use BART for a variety of trip purposes report the inadequacy of present BART operations in failing to provide weekend and late night service. Panel members who use BART for a variety of trip purposes want to travel during the weekend leisure and household errands time frame. Also, they want assurance of late night service so that they do not have to worry about shortening their trip or becoming stranded late at night. The present variability in the time of the last BART train from different station areas seems to increase the uncertainty and fear of being stranded, and thus probably serves to suppress nighttime use of BART.

The time frame of BART service appears to be considerably less salient for the automobile-centered users in the panel. Auto users ordinarily conceive of nighttimes and weekends as regular times for car trips. There are some reports of desire to use BART for weekend and late night trips, but to a lesser extent than among transit users, whose concern for expanding present BART service was forcefully expressed:

On the weekend, he is forced to use buses and he deeply resents that BART does not run then. As a matter of fact, he blames this scheduling on a class bias, feeling that planners and administrators of BART are really not interested in serving lower socioeconomic groups. . . . he stated that New York has a public transit system while BART is a special interest system. (37, no car, low income)

The need for expanded BART service was also expressed:

J.'s attitude toward BART is very utilitarian. . .it has no special or symbolic meaning to him. If it's there, he'll use it, but he repeated over and over again, "it should run 24 hours a day, 7 days a week."
(Single, no car, 19th Street, Oakland, low income)

For regular car users BART is a daytime, week day vehicle, with use during evenings being the exception at the present time. They may or may not consider weekend service an important innovation for service hours, but they do not generally report or otherwise indicate that significant changes in their patterns of BART use and life style routines would follow on the heels of expanded service hours.

The Expense of BART Travel: The Pricing of BART Tickets

For the single person on work trips and occasional non-work outings in Central Business District areas, BART is competitive in price with the small automobile. However, for regular use, BART is not competitive with A.C. Transit or MUNI, and for regular non-work trips of two or more persons, BART is not competitive with the car based upon most panel members' estimates of car operating expenses. Only 15% of BART users report travelling in groups, and this includes travel to and from work during peak periods. Where there are no or few out-of-pocket expenditures for tolls or parking, BART is experienced as relatively expensive by a large segment of the panel, and not sufficiently competitive with car travel for two or more persons. The limit on present BART service hours combines with the absence of off-peak and/or group discount fares to discourage structuring of non-routine group activities around BART access to new destinations. Some panel members volunteered that BART use by their families would change significantly with an extension of service to weekends and institution of a reduced fare or discount group ticket program.

They both wished that BART ran on weekends, and the BART feeder buses on Sunday, if only once every hour. In any case, they claimed to know of families who would use BART for family outings, especially in the summer, if BART ran on weekends and if there were some sort of family discount rate. The daughter kept saying that BART needs to lower the prices and run longer, that it needs to get to the masses. She claimed that "as we all know, 30% will never give up their cars," but for the rest, BART should provide better service than it does. Ms. K. felt that if there "was a way to get there, families would take advantage of cultural programs that are free or inexpensive," and that people would use BART to get to Fisherman's

Wharf, Chinatown, and the DeYoung Museum. She used to live on Long Island and got used to the shuttle bus and Long Island Railroad running. (Ms. K., retired, 67, and daughter, Concord)

Youth and Senior Citizen Discount Tickets and The Need for Sponsored Orientation Programs

BART tickets are available for all users in 25¢ to \$20 denominations at the BART stations. However, BART discount tickets for senior citizens, the physically disabled, and youth under 12 are available only at participating banks. The senior citizen discount tickets are a 90% discount: a ticket with a face value of \$6.00 is vended for 60¢. The handicapped and youth discount tickets are both 75% discounts, with the \$6.00 discount tickets being sold for \$1.50.

Some Family Panel respondents reported they would be more likely to take group family trips on BART if it were possible to buy reduced fare youth tickets at the station. The non-availability of youth discount tickets in the station is not understood, and is experienced by some panel members as a real limitation on their freedom to take family trips and the freedom of youth to go on outings by themselves.

Similarly, the responses of one senior citizen Panel member suggest that the availability of senior citizen tickets at the bank is not sufficient to establish a link between transit dependent senior citizens and the BART system. The senior citizens are familiar with the bus and must be introduced to BART in order to seek out senior citizen discounts tickets through the banks. One respondent reports that she did not "know" about the discount tickets until she was informed about them by a man at her church. Studies of modernization and public health programs have helped make program analysts aware of the need for delivery systems of new services to be filtered through the worlds of the potential new clients. BART should benefit from an understanding of the need to develop sponsored orientation programs for introducing new clients to the system and to the discount ticket procedures for youth and senior citizens.

Beyond provision of sponsored programs such as tours of the system through schools or with senior citizen organizations, BART could enhance its appeal to transit dependent youth and senior citizens by making discount tickets available to these potential off-peak patrons at the stations. Even with the bank discount ticket program, the non-availability of tickets in the stations serves to suppress use of the system for unplanned journeys by youth or senior citizens. As such the ticketing system is biased toward routine travellers. It does not fit into the organization and timing of unstructured leisure routines of youth and retired senior citizens. This may account in part for the relatively low BART ridership among persons 65 and over.

o Automobile Access and the Style of Automobile Use

Cars and Control of Route Scheduling and Pace

Their car offers door-to-door convenience, safety, speed and no waiting. B. seems to like his car; he says, "it runs like a cougar; it is going well and not too heavy on the gas." (Family of two, one car, San Francisco)

"The car is convenient, flexible, fast and cheaper when the whole family is going somewhere." (Family of three, one car, Concord)

(In the car) she can come and go exactly as she pleases, is protected from the "elements," and drives right to the door and the car gives her more time than BART would. (Family of two, two cars, Fremont)

"The car has good flexibility, is utilitarian and the radio breaks the monotony of driving." (Family of three, one car, Berkeley)

He thinks people drive cars because they like to be "masters of their own destinies." (Family of four, two cars, Orinda)

Among car owners in the panel, there is almost uniform agreement about the relative access virtues of the automobile in comparison to BART or other public transit.¹ The car is described as providing flexibility of scheduling, convenience, the ability to go wherever you want, whenever you want, with control over which route you take, and convenience for carrying packages or other items. What becomes clear in discussions with panel members about their regular routes of travel is that most develop and claim knowledge of the fastest ways to travel between their regular origins and destinations. They report using the back streets or alternative routes during the rush-hour period, and they consider the speed and efficiency of car travel to be one of its primary virtues. Also, the car is accurately perceived as less expensive than BART for group or family trips. It is very consistent with the view presented of the automobile virtues that the primary use of BART by car owners occurs during the rush-hour time frame where the possibilities for individual control over the space and speed of travel are severely limited by the traffic density along main corridors.

Nevertheless, Panel members do admit economic constraints on their attitudes toward car use for their routine trips. BART is perceived

¹Refer to Table #9, which appears on page 34 for levels of car ownership among Panel members and auto availability of BART riders.

by regular commuters to the San Francisco Central Business District as more economical, because of out-of-pocket expenditures for parking and tolls. Additionally, the majority of panel members consider BART to be more relaxing and comforting for rush hour travel than their automobiles. But, in most cases, the positive characteristics ascribed to BART's physical layout, and the ease of not having to drive do not encourage a very substantial mode shift in non-routine travel among regular BART commuters.

The only regular exceptions to this pattern appear to be occasional shopping and recreational trips to the Central Business Districts of Oakland and San Francisco and trips to the Oakland Coliseum. For these trips, BART is experienced as relieving the traveller from the problems of negotiating city or Coliseum congestion, and parking. For a more limited segment of the Panel, BART is also considered more practical for travel to institutions of higher education. BART is chosen for these trips because of problems in parking or because the trip is also connected with the work trip. Other non-routine uses of BART by car owners are quite irregular. The convenience of the car combines with the expense of BART for group travel to encourage a de-selection of BART for non-work and non-educational trips. Under present service conditions, BART has only a limited impact on the non-routine travels of most panel members who have car availability.

BART Impacts on Savings on 'Wear and Tear,' Gas and Maintenance Expenses for Users' Automobiles - Effects of Savings on Household Routines

He has noticed less wear and tear on his car now that he uses BART so much. The tires, particularly, last longer. He figures he uses the money saved from the car for recreation activities. (Single, South Hayward)

He figures he saves about \$70.00 per month on his car by riding BART. When asked how that money was used otherwise, he said, "I am in the income bracket where I don't have to worry about that; I do think about it, but I don't have to budget that closely." (Family of eight, two car, Walnut Creek)

Other users report that BART saves them money or that it is less expensive but they do not actually realize the savings as so much off automobile expenses. The automobile expenses tend to be taken for granted, and changes in these expenses are absorbed into the budgetary routine so that people are not conscious of BART saving them money on their car expenses. Since they do not perceive BART's impact as so many dollars of savings on car related expenses, it has no immediately apparent life style impact that can be reported.

Cars Not Bought, Not Replaced, Or Made To Last Longer

Presently, the E's have two cars. With BART use, they have found that owning one car is feasible and when one of the cars quits on them, it will not be replaced. (Family of two, Alameda)

Money saved from being able to drive a Honda instead of a car goes unnoticed. He said "the bills go into a big pot and we try our luck." He figured, though, that he saved \$200 not having two cars, but he couldn't really say where the money goes. (Family of five, one car, Lafayette)

Most Panel members do not experience any impact of BART on their ability to avoid or defer purchasing a second car, or defer purchasing a new replacement for their first or second car. Among the Panel of 75, seven households report some BART impact upon their plans to purchase an additional car or replace an existing car. As in the case of BART's effects on the expense of running and maintaining their automobiles, most BART users do not consciously relate their patterns of BART use to their budgeting of auto expenses. Panel members had difficulty estimating their total monthly auto expenses, or tended to under-report car operating expenses if we compare their estimates to official estimates by transportation analysts. Car usership is ingrained in the existing routines of car owners and in most cases, BART substitutes for only a small segment of the trips formerly taken by automobile. These conditions tend to render perceived BART impacts upon car ownership and replacement small or largely invisible.

BART and the Non-Access Characteristics of the Automobile

There is a radio in the car, and they always listen to it.

He likes the feeling of cars at night and doesn't like to wait for mass transit with a date or between clubs. (Single male, Berkeley)

Mr. E. spent a lot of time telling me about his 1962 Impala. He said that it is in perfect condition, not a scratch. It is really a nice car and it's worth \$1,800, the same today as when it was new. Later in the interview, I found that E. doesn't drive the automobile since his eyesight has gotten worse.

There were relatively few affective statements throughout the panel interviews on the beauty, specialness, fun, or other non-access characteristics of the automobile. Statements about difficulties driving and

finding parking, pollution caused by cars and the greater convenience of cars for their access characteristics were much more frequent than affective statements by owners about their cars. From literature on the car culture, it appears that attachment to cars as attractive objects is either much greater among the general population than among the panel or that panel interviews did not tap this area of affective responses. The only consistent non-access attribute which panel members reported was regular use of the radio, and for a small sub-sample, the use of tape players. The importance of music in transit for some panel members is suggested by the strong expressions from three panel members of the need for good music on BART trains. The lack of affective attachments to their automobiles may be a life style characteristic of regular BART riders. The BART Market Segments Study suggests that persons with strong attachments to their automobiles are a special sub-population with a very low level of BART use. By way of contrast, the circle of meaningful self-definitions of BART Panel members appears to include concern with ecology and environmental quality.

However, the respondent who talks about cars feeling better at night, may be speaking for the rest of the Panel. Other Panel members also report preferring car travel for their recreational activities. Recreation is centered around their children and the car.

They drive to amusement parks, zoos, and movies, and go picnicking and camping. (Family of four, Oakland West)

Particularly for the world of dating and the realm of weekend family trips, there must be a change in BART service and fare policy as well as a change in the public images of transit, for BART to begin to displace the car from its leisure time prominence.

Cars and Security - No Problem With the Unknown World

"Cars are like a little house that you carry around and always driving a car can let you forget where everyone else is." She found that riding BART into Oakland for jury duty helped her "lose her sense of insulation and isolation" and she feels that this is good. (Housewife, 50, household of three)

It becomes clear from the interviews that regular drivers greatly appreciate the privacy and predictability of their car trips in addition to the flexibility and convenience that they provide. For car owners, the world is mapped and predictable from experience with car travel routes. Particularly during night time travel, this secure, predictable and enclosed character of the car is experienced as the greatest protection against the uncertainty of the public streets. As the section on

safety and security in the public space makes clear, a primary feature of Bay Area travellers' security to negotiate the nighttime environment is their reliance upon private car travel.

o Ideational and the Norm - BART Impact on Opinions About the World of Public Transportation, Environmental Quality and Serving the Public Interest

Reactions to BART as the expression of new public transit tend to fall along four dimensions:

- 1) Public transit is ecological. People should use public transit more. Cars are bad for conservation and the environment.
- 2) BART is inadequate as public transit because it needs better service, a wider geographic service area, and late night and weekend service.
- 3) BART discriminates against certain areas, for example, against Richmond Line and suburban areas by not providing direct service and better feeders.
- 4) General indifference about BART as a special or different form or image of transportation. BART is simply a functional tool which these respondents use where and when it is convenient.

She is concerned about ecology, but is not sure of how much of this anti-pollution stuff you can believe. She thinks people will ride public transportation if it is reasonably priced and if it goes where they want to go. She doesn't think cars are good, to have everyone depending on their own car. She thinks BART gets people going out doing more and nothing is sadder than people sitting at home and vegetating. People are afraid to go out on buses and can't afford taxis. Buses create their own pollution. (Mrs. F., 54, no car, BART use for work and miscellaneous)

She thinks all public transportation ought to be totally free. Everyone should have equal access, both in terms of the places to which the transportation goes and the time it goes. She said that "Brazil and Rome have tried this and it worked. It should run 24 hours a day." Yes, she would be willing to pay for this out of her taxes. (Mrs. H., working mother, 40, Pleasant Hill, non-driver)

BART-riding Panel members often hold clear images of public transit. Some third of the Panel identify with a commitment to ecological and conservation goals. They also offer a variety of suggestions for changes to facilitate a shift from reliance on the automobile to increased use of and ease on public modes. These suggestions show us what user consumers believe is necessary to make BART and public transit viable and attractive. They also provide insight into the beliefs and images which underlie ideals of public pride or dissatisfaction with BART as a public symbol.

She said "there would be no necessity for comfort if BART didn't take so long. BART is a blot on the technological reputation of this country." She reported that the Mexico City Metro is computerized, was built in two years, and cost less than was estimated. They use rubber tires on rubber beds, which are faster and quieter. (Single, Berkeley, occasional user, former work commuter)

"I would use public transit if it were convenient, and more extensive. But I am pessimistic about the possibility of wooing Americans out of their cars. The U.S. became used to the convenience of the car before the energy crisis, and asking them to use public transit is asking them to make a sacrifice." (Teacher, 50, rides BART to work and on occasional other trips, own car)

For her own convenience, comfort, and peace, as well as for environmental reasons, W. would prefer to use public transportation. But BART is not rapid nor dependable. She said that she has ridden BART 20 or 30 times and has had about three rides as scheduled. (32, single, head of household, car)

Criticisms of scheduling tend to be coupled with concerns about the system's limited service area and hours, or BART fare rates.

She wishes BART ran on a more dependable schedule, went to more locations where she needs to go, and had better parking and cheaper prices. (28, family of five, two cars, Fremont)

She likes the idea of public transit but says there is a need for better service. Getting people to use public transit is like trying to convince people to eat right - it has to be the easiest before most people will do it. (Single, dietician, one car)

He would like to see BART run 24 hours a day, 7 days a week, with lower fares. (Single, blue-collar worker, no car, Oakland West)

She had three suggestions which would "satisfy all her travel needs for local transportation: weekend service 24-hour service, and expansion to a larger geographical area, not in a straight line." (Family of two, Daly City)

Transit dependent persons generally define BART as a positive alternative to the bus. An improvement in BART service to include weekends and late nights would make the system more attractive for these persons' needs. However, these patrons also suggest that these changes be coupled with an expanded service area (the airports are most frequently mentioned by persons with car access), and better feeders (most frequently mentioned by suburban users) as incentives to draw new and more frequent users from the car-dependent regular population.

The Ecological View

This view is expressed by respondents who have the option of car travel and generally rely upon car travel but consider public transit a positive good that should be more intensely utilized by people. Often this ideational view is in conflict with respondents' concrete desire to get where they are going in the most convenient and quickest way.

The S.'s are both committed to mass transit. Cars are bad because they pollute, are too noisy, and use too much energy; plus parking is difficult, and traffic a hassle. "However, we have to plan any trips around driving our car because there is no way to get from our home to public transportation but by driving." (38, family of three, Fremont)

In some cases, limited service characteristics constrain respondents from living out their stated commitment to public transportation. But one finds equally often the admission of a real conflict between the flexibility and convenience of the car and the expressed moral commitment to public transportation. In some of these cases patrons suggest statutory inducements for public transit use:

He believes it is necessary to condition people to public transit, perhaps even raising the price of gas to \$2.00. (56, commercial artist, family of two, two cars, Rockridge)

This respondent lives in an area of high neighborhood conservation and environmental consciousness. The main BART user in the household enjoys BART for his work trip and occasionally for trips to the

Coliseum, but the convenience of the car makes it the dominant mode for other than the work trips.

Many BART users who profess their commitment to conservation and public transit also express criticisms of the inconvenience, travel times, or unreliability of BART. These criticisms help them to resolve some of the dissonance they experience when comparing the flexibility and predictable travel time of the car with the attributes of the BART system. Environmental quality concerns are not apparently sufficient in themselves to motivate new patterns of travel and activity.

BART Discriminates Against Certain Areas By Not Providing Direct Service

Under interim service there is direct transbay daytime service from stations along the Concord and Fremont lines. Persons travelling transbay from stations along the Richmond line must transfer to the Concord line at MacArthur or 12th Street station.

BART, she believes, has discriminated against minorities by providing them with less than full service to the downtown San Francisco area. She wants a direct line from Richmond to San Francisco. Also there should be weekend service, and fares should be reasonable. (Black female, family of two, two cars, Richmond)

She would like to see a direct line from Richmond to San Francisco. (Single female, no car, Berkeley)

BART Is Generally Not Competitive With AC Transit Buses for Peak Period Travel From Richmond or Berkeley to San Francisco

BART travel time from Berkeley to San Francisco may vary from thirty-five minutes with perfect connections to an hour and a half. Generally, the trip takes from forty to fifty minutes as calibrated by a field researcher for the study. The close to thirty minutes bus travel time from Central Berkeley is thus superior to the BART record. Nonetheless, the relatively high level of patronage for Berkeley transbay trips indicates a real selection of BART as the preferred transit mode. However, regular transbay travellers on the Richmond line see the disparity between Richmond to San Francisco service and service on the Fremont and Concord lines as a basic service policy inequity. The Richmond to Berkeley segment of the BART line traverses an area with high concentrations of ethnic minorities which contrasts sharply with the white residential suburbs enjoying direct San Francisco service on the Concord line and leads to expressions of perceived inequity in BART service priorities among a relatively small number of panel members.

Lack of Service to Blue Collar Employment Centers

One worker in a warehouse located near the West Oakland station expressed amazement over BART failure to provide service to the warehouse area near the docks of the Port of Oakland.

If he could use BART to go to work he would sell his car because cars are too expensive. He cited the cost of gas and insurance. Also, when he gets off work he is so tired and is afraid driving is not safe when you are so tired. He thought that BART really made a mistake by putting the West Oakland station where they did. He felt that if it were placed 'where it was originally planned' about 2 miles further toward the mouth of the tunnel, that hundreds of workers would ride BART daily. He said that that area is heavily industrialized, with many factories and Army facilities, and a lot of longshoremen are employed there. In his factory alone there are 200 workers. If the station were at the proposed site, they would ride BART and walk from the station which would be in the midst of everything. But, as it is now, workers have to take a bus from the West Oakland station. The bus service is very poor, so everybody takes their cars to work. He thought that most people wouldn't take their cars if BART truly served the area. (Single, San Leandro)

The Fremont General Motors assembly plant has a full day workshift of about 2,700 employees. However, the shifts begin just after 6:00 A.M. so that here again, BART service starts too late to bring day shift employees to work.

General Indifference About BART As Special Object of Concern or Special Type of System

Members of ethnic minority groups and former residents of large cities having extensive public transit systems tend particularly to view BART in a simple non-expressive way. These respondents expressed their view of BART as merely a pragmatic tool for getting them where they are going for certain types of trips.

"Bart. . .doesn't run my life. I use it when it's convenient." F's attitude toward BART is strictly utilitarian. He doesn't think about it, he has no image of it. (Male, 24, blue collar, no car, Oakland West)

"BART is simply practical for the work commute."

o BART Impacts on Youthful Riders

The Age Characteristics of BART Counties and BART Ridership: Do Youth Ride BART?

Age Distribution of Off-Peak Ridership

Jefferson Associates Observational Census East Bay 11-19	Three BART Counties 14-18 1970 Census	BART Off-Peak 14-18 1976 PPS	BART Off-Peak 18-24 1976 PPS
16%	8.8%	2.8%	16.8%

Transit Mode Choice By Age for Travel to Central Business Districts - Berkeley, Oakland, San Francisco

Conventional wisdom within social research on life styles and subcultural patterns within the United States suggests that after socioeconomic factors, one's position in the life cycle is the most critical variable in determining the routines of one's life style. In evaluating the meaning of BART for the life routines of youth, a primary question is - Do youth use BART and to what extent? Here we find rather contradictory data depending upon the data source and the time frame that we rely upon.

As indicated in Table #11, in two separate observational censuses of six East Bay stations, the Institutions and Life Styles Project researchers on youth identified the 11-19 age group as 16% of the travellers during the 2:00 - 4:00 P.M. off-peak period. However, the Passenger Profile Survey, which is a random sample of persons riding BART at all stations, identified only 2.8% of the off-peak ridership in the 14-18 age group. It is possible that younger-appearing youth were not approached by PPS interviewers, since no categories existed for persons under 14 and the emphasis was clearly upon adult ridership of the system. Additionally, the Jefferson Associates' census was done during the peak period for youthful travellers, a period which was not sampled for the Passenger Profile Survey. A reasonable interpretation might be that during peak periods, BART ridership may approach the census distribution of youth within the three BART counties, while other times, youth patronage remains below the proportional distribution of youth within the three counties. But, the consistency of our observational census data should lead us to conclude that a significant component of the youthful population residing near BART lines is on the system during some periods of the day.

The next question we can ask has to do with how young people use BART. The most significant feature of the answer to this question is that

TABLE 11

OBSERVATIONAL CENSUS

OBSERVATIONAL MEASURE
OF AGE DISTRIBUTION
FOR SIX OAKLAND STATIONS

TIME: 2:00 to 4:00 P.M.

SUMMER 1976:	
AGE	PERCENT OF RIDERS
11 - 19	16%
20 - 60	72%
60 and Over	12%
FALL 1976:	
AGE	PERCENT OF RIDERS
11 - 19	16%
20 - 60	73%
60 and Over	11%

These distributions are based upon observed frequencies of riders in six East Bay BART Stations. Stations included are MacArthur, El Cerrito Plaza, Fruitvale, Oakland 12th Street, Oakland 19th Street, Lake Merritt.

young people use BART differently than do adults. In the spring period (See Table #12) only 31% of the youth ridership were taking trips related to work or school, whereas a vast majority of their trips (69%) are for visiting with family and friends, recreational, shopping, and other non-essential types of travel. For older riders, the patterns are clearly different. Over half of adult BART travellers are regular daily users, with 60% of the off-peak trips of the 18-24 group, and 62% of the off-peak travel of the 25-34 group for school or work. During the peak periods, the pattern is even sharper; over 90% of those in the 25-44 age groups are work commutes.

The contrast with youth, then, is startling. If we look at the trip purposes of youth who were interviewed on or around BART in 200 spring and 100 summer contact interviews, we see the distinctive pattern of youthful users of BART. Among the younger riders, there is a clear pattern of fun and recreation in their use of BART. For some, BART itself is the fun as expressed through "joyriding" (something we found to be more common among the younger group, ages 10-14). Beyond that, for the young, BART is a vehicle to recreation and cultural activities (22% in the Spring Survey), for visiting with friends (10%), and for just "hanging out" (4%).

Family Related Impacts

In contrast to adults, there is a significant pattern among the youth of family contacts through BART. Among youthful riders, visits with immediate or extended family comprise a significant segment of trips taken. Of particular interest was the use of BART for commutes between the homes of separated parents. In the spring sample, trips to visit separated parents accounted for six percent of all trips. Further questioning revealed that children are separated from parents by rather extreme barriers of distance and inconvenience. BART offers a solution to these problems. In the words of one parent:

"(Without BART)...they wouldn't see their Dad as much...there's.. too much driving on our part, and we wouldn't do it as often."

BART was a way of solving other aspects of the regional dispersal of families. Often, children would use BART to visit parents, grandparents, and other relatives at their work site. Such trips would be virtually impossible for some of these young persons without BART.

Recreational and cultural activities emerge as another feature of the youthful use of BART. For example, in our sample of youth we encountered several members of the San Francisco Boys' Choir who frequently use BART as a way to get to choir practice. For many such young persons, BART opens up a wide range of new possibilities for recreational

TABLE 12

YOUTH TRAIN STATION INTERVIEWS TRIP DESTINATIONS

(Figures in percentages)

SPRING 76		SUMMER 76	
School or lessons	29	School or lessons	7
Visit Family or* Relatives	14	Visit Family or Relatives	14
Visit Friends	10	Visit Friends	20
Shopping	12	Shopping	16
Recreational/Cultural	22	Recreational/Cultural	11
Joyriding	4	Joyriding	13
Work	2	Work	8
Hang Out Places	4	Hang Out Places	10
Other	3	Other	1

* Includes 6% visits with
Separated Parents

+ If we include joyriding and hanging out, the Summer includes more recreational trips. However, during school youth appear to be more likely to travel to specific destinations rather than traveling for non-specific recreation.

and cultural involvement, especially those activities centered in the downtown area.

What this overall pattern reveals is the considerable difference that is found in the youthful use of BART, and perhaps, the untapped potential that lies in more effective planning around emerging mass transit planning. The overwhelming bias in service - and even planning around mass transit for work commuters results in serious underutilization of the system by other population groups. Without question, the results we see here are a slim projection of the ridership and utilization that might be possible if serious attempts were made to expand both the transit service and the recreational/cultural activities offered by the metropolitan area.

The Issue of Independence

Clearly, growing up in a contemporary metropolitan environment is a complex business, of which the major dimensions lie well away from the phenomenon of mass transit. Yet, what we have found is that BART does enter into the process of "growing up" for at least some individuals in the Bay Area; and more than that, a number of policy issues can be considered that relate to how BART might become much more effectively a part of helping and teaching young people to cope more effectively with the metropolitan environment.

The emergence of independence is one of the central features of adolescence, a feature which is to be negotiated by the individual and her or his family. Over time, the family unit must accommodate to the phenomenon of "passage." Anthropologists, in particular, have pointed out how the highly concentrated "rite of passage," that is characteristic of technologically unspecialized societies, has been replaced by a virtually infinite series of events whereby the independence of the child becomes negotiated by child, parents, and other family members.

This independence, of course, consists of many elements relating to the developing social self. One of these has to do with physical mobility, and this is where BART enters the scene in the Bay Area. BART has the potential of taking the young person out of the sight, and thus, the control of the family. How do the young persons and their families, in our samples, see this possibility?

We found that the response depends on how the issue of independence is defined. At the most elementary level, the availability of BART "frees" both child and adult. The child is free to move without parental monitoring and supervision. The parent is free from the demands of supervision, or more importantly, from the need to actually provide the transportation. BART replaces mom or dad as the chauffeur. A common response among young persons interviewed when asked about how their parents viewed the youngsters' use of BART, was that parents appreciated being freed from the obligation to provide transportation:

"It's a lot easier on them - mom doesn't appreciate running us back and forth."

"They like me using it - BART saves them trips driving me."

This perception is verified in the parental responses which also indicate that the child's use of BART frees parental time:

"It gives me more free time, not having to drive my son as much. I do things that I want to do instead of being in the 'mother role'."

"It makes it easier for them, but mostly for their dad and I driving."

"Since she's been using it, I have more free time."

In turn, young people are aware that their own freedom of movement has been increased by the presence of BART, that they are now able to, as one of our respondents puts it, "visit places that otherwise would be limited to you." Some also indicated that this independence of movement frees young persons from conflicts with parents not only about destinations, but also about the problem of transportation:

"I feel freer to go with no hassles...BART makes it easier to get around rather than getting rides from parents."

"What I like about BART is no hassles with parents dropping me off and picking me up."

Not all young people or parents, of course, share this enthusiasm for BART. Some indicated a high level of anxiety and concern with regard to BART.

"I don't like him travelling around alone at night."

"Mom worries about BART; she doesn't trust it at all."

"My parents are worried about what other people will do to me; they would rather not have me ride."

"Stations are lonely; and if you needed help at night, I wonder how someone would deal with it."

However, this level of concern is, as one might expect, most commonly expressed by or for younger children, especially young females. It is natural that parents would want to provide more protection and security for younger offspring. We did note a hint in these data that such concerns were likely to emerge in families with a cultural

background which builds a greater level of protection around young children, such as Asian cultures.

Apparently, as children age and gain experience, these earlier fears begin to dissipate, specifically with regard to BART use. What seems to make a difference is experienced success and experienced safety on BART:

"They're used to travelling and know how to get to any place they need to go."

"My son was late home once, and I didn't worry too much, he had gone to Fremont by accident. He didn't panic but figured his way out."

"At first mom worried, but then after I rode, it's OK... she'd rather have me ride BART than her having to drive me."

"When I first started, she'd ask me how I would ride with all the stories about doors flying open or computer breakdowns, but I don't worry about it."

"They think it's all right, because I've ridden by myself and it's been OK."

In other words, when individuals have some direct experience which permits them to learn how to cope with the problems that attend to a transit system, they are more likely to feel comfortable with their ability in the future to come to grips with emergent problems. A further feature of this process of experiencing success and safety is the negotiation of routines for relieving tensions:

"Mom wants me to call from the station when I get there."

"I watch out who I sit next to, etc."

"My parents don't worry, not unless I get home late, but I call them when that happens."

We also found among some of our respondents that if parents themselves use BART, this serves as a device for reducing anxiety:

"Dad goes on BART everyday to work, and thinks it's safe."

"Mom used to be scared until she used it one night when she was late."

At issue partly is the relative safety of BART, given in some instances that it is necessary to use public transportation: (From parents)

"I think it's safer by BART - There are bad vibes at the bus stations - all types of characters...I worry when they go to the Greyhound depot."

"I feel he's safer in the station and out of the rain than waiting on the streets."

"I prefer BART for my kids. It's not cheaper, but safer and quieter."

When concerns are expressed (and our respondents did express them) they sometimes have to do with worry about particular times (late evening) or about what are perceived to be dangerous places:

"I wouldn't want her to walk anywhere at night; getting to and from the station is very worrisome."

"My brother was worried about me riding alone to Richmond."

"When I go to Oakland, they worry and tell me to be careful."

"I wouldn't want them wandering around Frisco or Oakland."

"I'm a little anxious about them going to the Coliseum not knowing that area."

For some parents, overcoming such fears is a motivating factor in encouraging their children to make use of BART:

"BART has given him independence - he's shown he's more responsible, and he gets more privileges."

"It helps my daughter's total growth by giving her a sense of responsibility for her own actions to learn and see new places."

"My parents don't mind it. They want me not to be afraid to ride public transportation and will encourage me."

"Another time, my son was pushed around in the station. I think that's important for him to come up against and handle himself."

"BART teaches my daughter how to be involved in decision-making and to plan better; BART gives her exposure to different people in the Bay Area...it has helped her tremendously to grow."

BART's an impersonal way to travel which is an advantage. There's nobody helping her around or saying, 'Where do you want to go, little girl?' - she has to go alone. She is proud of herself, she knows she can go anywhere."

Looking at the overall pattern that can be derived from these results, it seems that some parents see very clearly the role that public transit can play in the gradual development of an independent child. Being able to cope successfully with one's physical space obviously becomes part of competent coping with the world. In the complicated world of the contemporary metropolis, the ability to independently utilize the available public transportation system critically affects the degree to which one can involve oneself in the opportunities afforded by that world. For young persons, who are fundamentally dependent in an economic sense, and therefore also transportation dependent, it then becomes especially important to consider how some come to negotiate their independent use of public transit systems successfully, and thus, how further policies can be evolved for this group.

First and foremost, of course, is the need for the policy makers to consider carefully what the full pattern of these results mean. One major set of conclusions is that young people are presently a more significant element of the BART-using population than some age-biased data would suggest, that young persons have very different patterns of use of the transportation system, and that young persons are much more dependent upon public transportation than other categories. One might even go so far as to raise questions about the public morality and ethics of transportation systems organized so fundamentally around individuals who clearly possess the economic capacity to develop their own alternatives. The issue here is not whether the public transportation system ought to be available to the commuter, since obviously there is one basic user population. However, there are other populations of users, and it is obvious that in such ways as hours and days of operation, particular kinds of use are emphasized at the expense of other uses and priorities. These other uses and priorities involve individuals, in this case the young, who are especially vulnerable to policy decisions relating to public transportation.

Second, drawing upon these data, it is clear that there are ways that individuals, on their own, have developed successful routines for negotiating use of BART. What this suggests is a variety of ways of creating what might be termed sponsored negotiation routines whereby young people and their parents are brought together in scenes of public education and action, and are taught modes and methods for safe and effective use of public transportation. A wide range of community settings exist wherein such routines might be developed: schools, recreational agencies and organizations, community service centers, etc. What would be especially effective would be the development of combination action and transit programs, where the negotiation routine to be learned would be considered

as part of some desired action goal (attending choir practice, going to the art museum, seeing a movie in the downtown area) which is connected with the use of BART.

Youth and BART Impact on Business

On the basis of the over 200 interviews with informants in businesses proximate to BART stations, BART use appears to be too dispersed and involves too small a conglomeration of youth to enable identification of clear and significant BART impacts upon youthful patronage and hang-out activities.

In certain instances (e.g., Bay Fair Shopping Center) proprietors of youth-related businesses reported the presence of a large number of school-age youth during weekday school hours which they associated with BART. However, interviews with youth on the scene at Bay Fair found that of the 45 youth present, none had come by BART. In short, congregations of youth do exist in certain districts such as Bay Fair Shopping Center, Downtown Berkeley, and Powell Street, San Francisco. But in-store and on-street interviews suggest the greater part of these youthful populations to be unrelated to BART. While BART has significant meanings for the youth who use it with some regularity, this group is not sufficiently large to approach through analysis of activities and gathering around youthful type stores and hang-outs. Nevertheless, in this realm as in other aspects of our research, we find that the very presence of BART results in the interpretation by people on the scene of BART impacts upon local activities. These cognitive associations of causality echo the point discussed in greater detail in the section on BART's meaning for regional life styles - that BART alters the social and physical landscape above and beyond the travel behavior of its particular patrons.

Possible Expansion of BART Use by Young Persons

Since young persons' lives are likely to be place-bound between the hours of roughly 8 to 3, while their evening time is likely to be restricted by parental regulation, there are, in fact, not many actual hours when they might be free to take advantage of BART. A major portion of their free time is on weekends. When asked about ways they might suggest to improve BART service, a frequent spontaneous response was that service should be extended to weekends:

"If it ran on a Saturday, I wouldn't need a car."

"I'll be able to work overtime when BART starts running on Saturday."

"If it ran on weekends, all of us would use it more."

"I wish it ran on weekends, I'd see grandma more."

"If it ran on weekends, probably all of us would use BART more into San Francisco. That's when we're not working."

Parents, too, see the importance of weekend availability of BART for their children. Some comments of parents on this issue include:

"Run it on weekends; it would be a great help."

"I like the idea of extended hours and would like to see it run on weekends."

"Make the damn things run on weekends...what are we paying taxes for?"

For adolescents especially, their independent use of BART (not as part of school or family activities) obviously depends upon it being available when they have free time. Currently, the bias of service toward a commuting clientele actually serves to limit youthful use -- even as high as observation indicates that use is. As regular service is extended to weekends and holidays, it is to be anticipated that recreational and other BART uses by young persons will expand. Weekend service will provide for a wide range of new BART uses by young persons (as well as others). Weekend and weekday evening expansion is a bit more complicated, since a couple of factors can be anticipated. For one, it is important that the issues of safety be attended to--evening recreational use will not be considered if there are questions of personal safety (this obviously will be especially true for dating). There is also the issue of the schedule for last trains; one will hesitate if there is any possibility of being stranded.

There's a second way, in addition to time, that BART availability is restricted: Its cost. The young are economically dependent. For them, BART can simply be too expensive. Some comments illustrating this problem were:

"If it were cheaper, I'd use it more to go to Richmond and see my sister."

"BART is pretty convenient, but expensive. That's the main problem. It cost 90¢ to go to San Francisco."

What these two sets of comments suggest is that there are specific time and resource restrictions which interfere with wider youthful usage of BART. Obviously, both expanding the times of service, and extending some form of youth discount fares could be important steps for increasing youthful use of BART services.

o Expansion of Use by Schools

The availability of BART creates a wide range of possible institutional uses of a new form of mass transit in the Bay Area. At times it is useful to consider not only how institutions make use of mass transit, but also the issue of how it is not used. The effective use or lack of use of BART by public education is one illustration:

BART makes available to schools and school districts, a school group discount ticket plan. Schools are provided with packets of tickets at 25% of their face value for use in school group excursions. Excursions have been primarily taken by grammar school groups. The BART Public Relations Office, in charge of school group ticket sales, estimates that approximately 4/5 of the school group trips are taken by younger youth.

Ordinarily the school group trips combine destinations at museums, e.g., Oakland Museum or the San Francisco Maritime Museum, zoos (with bus connection), or walking around the downtown area of San Francisco. BART provides schools with lists of possible excursion destinations along the BART line. However, use of BART for school excursions has been relatively low among schools situated close to the line. Under ordinary ticket sales and service conditions BART estimates, on the basis of its Public Response Survey, that most patrons come from within a five-mile radius of the BART stations. However, among the schools taking advantage of the group discount ticket sales, the greater portion of group travellers come from beyond the five mile radius. In fact, of a total sales volume for the fiscal year 1975-76 of \$73,346.00, the greater part, \$38,401.00 are sales of discount tickets to users outside of the three BART counties. Apparently, use of BART by schools in BART counties for group trips is relatively low because of the low budgets for extracurricular activities, the lower economic status of much of the school populations (children and parents don't have spare cash for school excursion fares), and a relatively blasé attitude toward BART as a regular feature of the everyday environment. Schools outside the three counties apparently experience a trip on BART as an opportunity both to explore a new type of transportation and to tour the contours of the Bay Area region. For students outside the district, BART school group trips provide an experience of a new transportation mode linked with the investigation of the frontier of the urban centers. One respondent from the ILS Family Panel reports that for many of the children using BART for school group excursions, this is their only exposure to a wider sphere of the experience. They come from less well-to-do families, and the ordinary contours of their experiential world do not extend beyond their neighborhood and their school. BART injects them into the flow of the wider Bay Area world.

Another problem which undermines use of BART by schools closer to BART stations is that of access to and from the BART stations. For schools beyond walking distance, a trip via BART requires some type of bus connection between BART and the school. The difficulties and expenses associated with using two types of transportation lead schools to remain with their present conventional use of bus transit for most school trips.

Whatever the official reasons, it is clear from the responses of the youth we have interviewed that there is only limited formal school use of BART in their experience. When asked if they used BART "for school activities," a vast percentage of the respondents simply said "no." Common responses to this question when there were somewhat more elaborate replies, included:

"Once in a while for a field trip -- but usually they take a bus or use a carpool."

"No - I'm in Junior High and wouldn't have a chance to use it."

"No - I take the bus for field trips."

"We used BART for field trips last year, but not this year."

These responses indicate problems on at least two levels. On the one hand, perhaps BART personnel have not been inventive enough, persuasive enough, and insightful enough to develop educational uses of BART and negotiate these with educational personnel. On the other hand, what this also shows is the inability of schools to innovate, to seize the educational opportunities that become available as the environment changes, and to see these changes as a vital part of what education should be about. What BART creates is a wide range of new direct experiences with drama, art, music, politics, social agencies and services, recreational outlets, ecological scenes, and so on within the metropolitan area. Of special interest are the general issues of ecology and survival in the complex and problematic environment of the city and the specific part of these issues that relate to transportation and public transit.

It is easy enough to comprehend some of the reasons why schools are slow to respond. The curriculum is anchored firmly to a valued tradition and yields to changes at a grudging pace, so that attempting to organize both the challenge and opportunity of such issues exposes one to jibes of being "trendy." The processes of education evolve around "chalk and talk" methods, constrained by the fifty-minute (or less) hour. To be sure, schools have moved in terms of the shape of both curriculum and processes, so that some schools today are not recognizable as those caught in the traditional definitions. However, the general

pressures of tradition clearly work against the effective use of BART for tasks of education. In the experience of our respondents, only rarely has BART been connected with educational and learning activities. The vast and infinite features of the metropolitan environment now available for study and learning are not being tapped.

IV. CONCLUSIONS AND IMPLICATIONS

o Creating Social Value: Facets of Value Added That Might Be Affected by BART

Type I: Economic Value

One area of interest among social planners is whether new regional rapid rail systems result in the capturing of new economic value. The basis for calculation of value added normally depends on comparing the rate of commercial and residential development, the rate of generation of new employment positions, or relative increases in the assessed value of real property. By comparing time one and time two conditions, or areas with new transit service with those not served by a new facility, a measure of value is generated.

Our study cannot contribute to a calculation of BART impacts upon the actual dollar volume of retail sales nor the changes that may have occurred in the assessed values of commercial and residential development. However, our research suggests that over time BART will influence the definition of important characteristics in the selection of residential locations. BART's observed impact on the selection of residences by suburban commuters should, over time, be reflected in some form of value added.

Our investigation of BART impacts on consumption of routine goods suggests that it is much more difficult to influence the routine shopping of regular BART users. Shopping routines appear to be primarily linked to localized stores and shopping centers where car access is the dominant mode of travel. However, BART does appear to influence the taking of some shopping trips to the downtown centers of Oakland and San Francisco. These influences will likely be expanded under the introduction of weekend service.

BART also influences the selection of residential locations in some suburban and older suburban areas. Over time, BART may contribute to the desirability and development of certain suburban and older suburban areas, and thereby influence the sales of goods and services in these areas. However, the potential impact of BART on the agglomeration of consumption in the downtown centers appears to be limited by the localized, car oriented character of consumer's shopping routines.

Type II: Social Value

Transportation as a commodity may transform the experience of its users. Transportation related social value consists of changes in people's

experience, freedom of movement, sense of independence, and social and familial interaction as a result of new transit. It also consists of value created by lowering levels of fear and anxiety associated with travel in the public space, positive changes in the sense of mood, well being, and comfort resulting from net improvements in the quality of the travel experience. The creation of non-market social value is an important potential function of new transit.

BART appears to have clear and substantial impact on these nominally non-quantifiable aspects of social value. BART is experienced as a more pleasant, comfortable and less threatening public conveyance than the bus by most regular and irregular users. It appears to have significant impact on the reduction of tension and strain among regular commuters. Policy and service changes which might enhance BART's positive impact on the creation of social value are discussed in the conclusion and policy recommendation sections that follow.

Type III: Value Created Through Conservation of Energy

Each person moved out of their private automobile onto the BART system results in a net savings of energy consumption for trips that would ordinarily be taken by car. Family Panel findings suggest that BART is unique as public transit in the area in its ability to appeal to persons and market segments who previously would not have chosen to travel by public transit. Its particular combination of modernity and comfort makes it, as opposed to perceptions of the bus, a real social alternative to private automobile trips. Under conditions of weekend and evening service, and growing disincentives for car use (e.g., proposed higher bridge tolls and increasing gas and parking prices) BART holds the possibility of creating value through energy conservation by the transfer of trips from private automobiles to rail transit.

o Social Benefits and Equity of Benefits

It is clear from the Family and Life Styles findings that BART enhances the work commute experience of regular commuters, that it facilitates transit independence of youth, that it is a desirable and useful addition to the daytime, weekday travel alternatives of the transit dependent, and that it is an occasional source of pleasure for recreational and entertainment trips for the larger regional public. At present, it may be argued that regular commuters derive the greatest benefit. The transit dependents benefit to some degree during off-peak hours, but their benefits are constrained by the absence of weekend and late night service, the fare schedule, and the inadequacy of feeder and bus connections. The general public of infrequent users of the system derives very limited service benefits. Findings suggest that their use of the system would be enhanced under conditions of weekend service, late night service, and reduced family or group fares and/or differential fare schedules.

It must be recognized that:

- oo Different groups of people will have different interests, service priorities, and conceptions of what priorities shall take preeminence.
- oo Given the present system of operation, different segments of the community benefit in differing degree, though in principle, we should aim for an equity in the social benefits BART provides.

o Increasing Diversity in the Use of BART

A major finding in this study of life styles is that work commuters benefit both financially and psychologically from BART availability. These benefits derive from at least three sources:

- oo The fixing of BART schedules and headways with fundamental priority to peak hour commuting availability.
- oo The setting of the fare structure that benefits long trips from suburban peripheries of the system.
- oo The psychological quality of the service based upon providing efficient, comfortable, anonymous service, has the greatest experienced benefit for the regular work commuters.

However, transit dependent populations who rely upon public transportation for both non-work and work travel, suffer from limited BART feeders for non-peak periods, and the absence of weekend BART and BART feeder service. These findings suggest the following issues for further discussion:

- oo Should priority be given to extension of service to weekends and late evenings? Fuller use of the BART system for non-work purposes obviously will require that it be available during times when people (both transit dependent and commuters) tend to engage in non-work activities. Much of the recreational use, visiting with family and friends, and shopping excursions would naturally fall into the weekend and late evening time slots. When asked about system improvements, multiple purpose BART users, transit dependent persons, and younger people, persistently and spontaneously saw the need for extension of service to weekends and late evenings.
- oo Should a policy of differential fare schedules more favorable to transit dependent and group travel be considered? Expansion of service to transit dependent and non-work populations

and uses may require consideration of alteration of fare schedules. Such considerations are consistent with the observations that result from a survey of expressed traveler concerns and the impact of reduced fares upon non-work use and recreational patronage under special reduced fares (e.g., Labor Day). Two different issues are distinguishable here: fare reductions for particular transit dependent populations (e.g., youth and low income persons) and lowered fares for off-peak travel.

Fare and service schedule policies, of either type, which stimulate the taking of trips by transit dependent persons or usual non-travelers widen the effective service clientele and enhance the vitality of regional social, economic, cultural, and recreational activities. San Francisco has two dominant sectors of economic activity which are competitive relative to the status of these sectors in other head-quarter SMSA's; corporate and financial management, and tourism related sales and services (e.g., hotels, retail sales, entertainment, transportation, etc.). BART presently serves a significant segment of the managerial and financial white collar employees, and the government sector which represents a large component of the employment market. However, BART does not serve a substantial segment of tourism related trips. A BART policy which brought new patrons onto the system for travel related to recreational, cultural, and educational activities would contribute to this major facet of the regional economy: tourism and recreational enterprises. At the same time, there would be general social benefits of: providing enhanced access and experience for more transit dependent persons; providing more frequent use to a larger percentage of BART county residents; enhancing the vitality of the region by encouraging attendance at regional recreational and cultural center activities, and working toward a revitalization of the public space. These changes would counter the present trend of increasing fear and reluctance to enter the public space for other than work or limited car based forays. They would tend toward a revitalization of regional and sub-regional shopping and entertainment areas close to the BART line.

Reduced Fares for Transit Dependent Populations

BART presently makes available reduced fare tickets for youth under 12, handicapped persons, and senior citizens over 65. However, these tickets are available only at participating banks, rather than in the station ticketing areas. Our research findings suggest that to draw a substantial volume of these dependent populations onto the BART line, will require easier ticket availability consistent with the life routines of these groups. In some cases, notably with senior citizens and youth, our research indicates that there is a need for sponsored orientation tours of the system. The formal availability of discount

tickets has limited impact upon patronage when the travel alternative does not naturally occur within the rhythm, routines, and life experiences of the target population. Since more extensive off-peak use would benefit the system, and since the system is presently and substantially supported in part by a regressive sales tax, there are social equity reasons for making discount fares available for all off-peak travelers. Off-peak travelers are considerably more transit dependent, and generally lacking in other travel options relative to peak commuters. Further, in a period of increased concern with both social equity and energy conservation, making BART available for off-peak travel by transit dependents seems most consistent with a socially progressive transportation policy.

Contrary to common public belief, the present BART fare schedule is, in fact, a differential fare schedule. The cost per mile of travel on the system varies considerably depending on where one travels and the distance of one's trip. At present, the lowest fares per mile on the system are for travel from the suburban peripheries of the system to other points on the suburban line. Mid distance trips are the most expensive, while travel from the outer suburban trips to outer points on the other lines are significantly less expensive per mile. There is also a surcharge of 25¢ for travel across the Bay from any point figured into calculation of fares.

When the possibility of a differential or reduced fare schedule for off-peak or evening periods is raised, persons may suggest that this procedure violates Public Utilities Commission equity requirements. In fact, since the system is primarily subsidized by sales and property taxes, there is presently a differential "fare" in the relative share of personal income that taxpayers pay for their potential access to the system.

Since the public good is enhanced by the transfer of car travel to BART travel for trips that would ordinarily be made by car, and the off-peak and evening travellers tend to be more transit dependent and to have lower incomes, a reduced off-peak and evening fare represents both an incremental improvement in the equity of service - if it draws non-users and lower income transit dependents and serves the public good through a potential reduction in energy consumption and through potential revitalization of the public space.

o Non-Access Characteristics of BART

User comments on the non-access characteristics of BART have policy relevance for a number of issues. First, for persons to come to define public transit service in a positive way is a significant and necessary change. The redefinition of the public space as less threatening, more comfortable, and more pleasant as a transitional space between points is a first step toward encouraging greater use of public modes. BART's

policy of removing damaged or vandalized cars from service may contribute to this public image. However, some panel patrons seemed concerned with what they experienced as a decline in the cleanliness of some station and platform areas. Their comments suggest that physical amenities and comforts are important features of the rider's experience and should be maintained at a high level. In turn, high-level maintenance can help to establish public mores which discourage littering and defacing of the BART system.

Of greatest significance, from a policy standpoint, is that most users of BART view it as substantially different from bus service. The positive response of most users to the quality, comfort, and ambience of high quality rail cars appears to confirm the view that rail transit possesses non-access qualities of importance to consumers. Further, both car and bus users appear to clearly differentiate the characteristics of a high quality rail environment from their conceptions and imagery of the bus. It must be cautioned, however, that these present images of BART may be based in part in its predominantly prosperous, white collar clientele. It remains to be seen if democratization of use of BART through new service or new fare policies would contribute to a blurring of the present distinctions that are drawn between the quality and ambience of BART and the bus environment.

o The Democratization of Dignity. Social Equity Beyond the Private Automobile

One sociological observation that is confirmed by cross-cultural analysis is that access to "dignity" is a socially stratified resource. For many persons, the material conditions of their existence undermine the preservation of dignity. Their situation is defined in terms and conditions of survival in their daily routines which generally produce a loss of dignity. In the United States, there has been sufficient democratization of the living standard that most persons have access to some sense of dignity in their daily routines. Within the sphere of transportation, the car has established the conditions for travel with dignity for most family units with private cars. However, for persons who must travel upon public transit within the central cities, increasing conditions of fear and social unpleasantness prevail which threaten the passengers' sense of well being, and undermine the provision of public transit service with dignity for its riders.

For the commuting population of BART, the massed character of travel and the public visibility within crowds, while it undermines dignity, does provide some sense of safety; for the off-peak users, other conditions maintain. The computerized anonymity that produces an efficient flow of traffic during peak service hours may during low travel volume periods create a sense of cold emptiness. Features of automation and anonymity which are attractive during commute periods appear for

some off-peak travellers to rob the travel situation of the security and sense of dignity that are viewed as essential for recreational or other non-work travel. During off-peak periods, the absence of human presence combines with the cool modernity of the stations and the invisibility of station agents from the platforms to create feelings of insecurity and uncertainty. In particular, nighttime travellers and elderly travellers report feelings of insecurity because of the low volume of travellers during off-peak periods.

The likely fact of increased off-peak, evening, and group travel under reduced off-peak fares would likely contribute to humanizing the travel environment during present low patronage periods. At the same time, it would serve to democratize the access to high quality, more secure, comfortable facilities for those persons most dependent upon them, the off-peak transit dependent population.

In general, public policy decisions may need to focus on issues of dignity and security when considering the choices of automated or semi-automated facilities and when evaluating competing fare and operation policies.

o Life Style Areas Requiring Further Study

Our research activities make clear that BART is a different commodity to different persons in different locations along the BART line. Available personal options, economic resources and car availability, and structural and social neighborhood characteristics all serve to make BART have different meanings in different community case settings.

There is a need to specify further, through a community-intensive case study approach, the place of BART in the life style and social activities of particular community settings. There is increasing discussion within the transportation field of the possibilities of inter-modal transit. The life styles research and reports on BART riders on the system both suggest the present limited character of inter-modal use of BART. This seems, primarily, to be an expression of the lack of coordination between BART and other modes, inadequate headways of feeder buses, absence of inter-modal connections (other than walking or automobiles) at many points along the line, particularly during evening hours. Further promotion of or investment in inter-modal access to extend the transit service performed by BART must be founded in sound understandings of consumers' conceptions of the requirements for use of inter-modal transit. This research could be advanced by three community case studies. Three community cases might be selected which are representative of the three main types of service segments along the BART line: a suburban setting where transit and activities are organized primarily around automobiles and automobile access (e.g., Walnut Creek or Fremont); a suburban setting where there is a mixed

reliance on cars and other forms of transportation (e.g., Rockridge or Glen Park); and an urbanized setting where public transit routes and transit service characteristics are more developed.

This type of research should precede substantial investments in extended or altered BART service and designation of expanded bus/feeder routes. A community case approach could help to specify how to make best use of changes in service or routes in terms of serving regional community residents in varying types of social environments in the region.

V. METHODOLOGY

o A Life Style Typology: Operationalizing the Concept of Life Style

These following life style dimensions served as sensitizing concepts to guide the substance and format of the research process. Since the dimensions are located in the empirical world, the technique should be transferable to other areas. The technique is also applicable to analysis based upon adjusted quantitative data available from census information and social and transportation impact studies.

The present research is essentially exploratory. The approach is sufficiently open-ended to enable identification of the main areas where we may expect to observe transportation impacts upon life style, and the types of impacts, in terms of behaviors and meanings that transportation changes hold for nine areas of individual and group life routines.

We have listed below the general content of the nine dimensions that served as a focal point for our panel studies, field interviews, and field observations.

Consumption and Consumption Style - Variations in Location and Style of Consumption of Goods and Services

Patterns of consumption serve to define distinctive ways of life of persons within differing socio-economic strata. The style and location of consumption, whether persons shop locally at small stores or shopping centers, or regionally in central shopping districts, help to distinguish differing life routines. We expected that BART use would be related to consumption of goods at regional centers, at local shopping centers, or at specialized stores proximate to BART stations. In other areas, consumption may define life style but is not likely to be linked to BART impact.

Work and Work Routines - Variations in Work Travel Patterns and Work Related Routines Among Major Employment Categories

This dimension serves to distinguish respondents by differing employment categories: managerial and professional white collar; non-professional white collar (including clerks and sales persons); blue collar workers; and differences in their routine and timing of work, including individual control over scheduling of the time and place of work. We expected to observe different types of BART use and magnitudes of impacts upon work and work-related routines among these different employment categories, and also looked to observe

possible BART impacts upon the scheduling and conduct of work, psychological attitudes toward work and the work trip, the location of work, and the space available for the transition between household and family roles and work-related activities.

Residence Selection Decision-making - Factors Affecting the Type and Location of Housing, Suburban and Urban Residential

We focused upon two major questions in the choice of household residence location. Does access to BART change the perceived desirability of certain areas, and does BART sustain, support or encourage the maintenance of a particular type(s) of suburban-urban life styles?

Recreational and Leisure Activities - Location, Character, and Time Budget Patterns of Recreational Activities

In focusing on recreational and leisure activities, BART impacts upon the frequency, location, and type of leisure activities. Would BART facilitate travel to certain types of recreation and leisure activities, such as the Oakland Coliseum, downtown movies, plays, museums, opera, theatre and other Oakland cultural events? Would BART serve to influence participation in regional or local recreation activities? We expected the impact of BART on recreational activities to vary among different household and family types.

Visiting with Family and Friends - Geographic and Participatory Variations in Visiting Routines

The frequency, location, extent of participation, and travel mode used to visit with family and friends serves to differentiate life routines among individuals and family households. Of particular interest to the study were observable BART impacts upon kinship and friendship ties within the region. One hypothesized impact on family and friendship ties was an increase in visiting and articulation of family and friendship networks within the region. We also expected variation in the frequency and importance of visiting by ethnic sub-group, age and household size. BART would potentially have greater impact for persons having an extended range of regional visiting locations.

Scheduling and Style of Routines - Including Complementarity Among Household Members' Routines

Respondents may vary significantly in the organization and scheduling of their routines, and impacts could similarly vary from relatively small changes in the scheduling of routines around BART's unstructured departures and arrivals to stimulation of systematic re-organization of existing routines. The ordering of routines is corollary to work and family obligations for many respondents, and family trip planning necessarily was expected to vary with the number of cars available and the number of BART users in the household.

Automobile Access and the Style of Automobile Use

The study was concerned with three dimensions related to the automobile access and the style of automobile use:

- oo Is a car available and what portion of chosen trips are taken by car?
- oo To what extent do respondents' timing and sequence of routines revolve around the availability of the automobile?
- oo To what extent is the respondent involved in the use and maintenance of an automobile for symbolic, affective, or other reasons than access to and from particular destinations?

We were also concerned with the expenses of automobile maintenance and decisions to purchase, sell, or defer purchase of an automobile, and the meanings of these decisions for family budgets and family routines.

Use of Public Transportation and the Experience of the Access and Non-Access Characteristics of Public Transit

Clear patterns of differentiation exist between the routines of public transit users and those who combine BART use with automobile travel for most routine trips. Expectations regarding the efficiency, reliability and comfort of BART service will vary to some degree in accordance with present or past use of public transportation. We were interested in possible BART impacts upon people's use and experience of public transit.

Ideational - Normative Style

The concern here was with the types of beliefs, identifications, attitudes, and opinions which respondents hold toward public transportation, environmental and energy concerns, car use, and BART, including feelings about BART as a symbol of the public sector.

A stated commitment to public transportation may be in harmony or conflict with people's actual use of public transportation for their own travel needs. Early studies suggested respondents' tendency to over report anticipated and actual levels of BART use. A regular BART commuter may ideologically extol BART's virtues and deplore the environmental drawbacks of the automobile, but behaviorally his BART use may be trip specific to the work commute. One aspect of concern is to determine the impact of environmental, conservation and social philosophies on the actual organization of respondents' travel routines.

o Research Approach

Population of Interest

Early in the research process a decision was made to focus the research activities upon a population of BART riders. This special focus on BART riders was necessary to insure exploration of BART impacts on life styles and families, since regular BART users comprise a relatively small percentage of regular transit users in the region. Preliminary regional population samples had failed to tap into a large sub-sample of BART users. Also, the population of BART users is too widely dispersed and not sufficiently large - taking the Bay Area as a whole - to be included in all its sub-group characteristics in a stratified sample of manageable size and cost. Thus, a case study approach was adopted to select different types of BART users, rather than aim at a representative sample. The Family and Life Styles study was designed as a deliberate attempt to look first at the affected population and to enumerate the meanings of BART for representative types of life routines among the panel of BART users.

Preliminary Data Base

Family and Life Styles Field Contact Interviews: N=450

These short contact interviews were designed primarily to indicate types of BART use, for insight into recreational and cultural uses of BART, and as a source of respondents for the Family Panel interviews. The instrument was designed to allow quick administration on trains, stations, or on platforms. Basic information was collected on trip purposes, origin and destination stations, frequency of BART use, occupation, scheduling of observed trip, BART use by other family members, number of persons in household, ethnicity by observational census, and use of BART for educational/recreational purposes. Records were also kept for telephone re-contact of respondents. Respondents were selected during peak, and evening periods with the aim of compiling a large, demographically stratified reservoir for selection of Family Panel respondents.

Unstructured Community Observation, Field Interviews, and Resident/Bus Driver Key Informant Interviews

Some field work was done in the neighborhoods served by BART to establish a sense of the character, make-up and manifest life style characteristics of differing residential areas. These descriptive sketches were intended to provide preliminary insights.

First Stage Family Panel Interview: N=75

Selection of Respondents

Family panel members were selected primarily from the Field Contact Interview respondents. The selection of panel members was deliberately

stratified to include different employment categories, black, white, Latino, and Asian women and men. Cases were selected to exemplify different types of BART users, including work commuters, non-work trip users, and multi-purpose users (work plus other trip purposes).

The panel also included households with 1,2,3, and 4 or more members. Case selection approached, in most respects, the distribution of demographic types among the profile of BART riders compiled through the Passenger Profile Surveys. However, in order to tap populations whose BART impact experience would inform policy-making, some over-selection of minorities and multi-purpose users was undertaken. In addition, since multi-purpose and non-work trip BART users are more likely to come from younger and one- or two-member households, the panel reflects an over-selection of single persons. These patterns of over-selection were conceived as strengthening rather than distorting potential panel findings. In our deliberate focus on BART uses and areas of likely BART impact, it was also important to include population sub-groups most amenable to life style change. Existing research on life style and life routines suggest that both household sizes (largely as an expression of place in the life cycle) and membership in ethnic communities are powerful forces toward the shaping and direction of life style routines. (Zablocki and Kanter, 1976)

In the course of our Family Panel selection, we found that difficulties emerged in identifying and gaining access to blue collar and minority households. Lower-income and minority households often provided field interviewers with incorrect or disconnected telephone numbers when we requested re-contact information. Also, the low proportion of lower income and ethnic minority families on BART made initial contact with these groups more problematic. We resolved the problem of panel representation for these sub-groups by intensifying our exploration of field contacts and references to gain introduction and entry into ethnic minority and blue collar households.

Case Study Interview Format

The Family Panel interviews were conducted by trained interviewer-ethnographers. While all research personnel were provided with a standardized interview format based upon the nine life style dimensions, explicit instruction was given to achieve a conversational case-study approach to each panel member. Emphasis was placed upon the need for comparable information along the range of life style typology dimensions, and equal concern was expressed over establishing rapport with respondents and adjusting the interview approach and probes to the particular needs and demands of respondents and setting.

In most cases, interviews were conducted in the home so as to gain the most complete participation by respondents and any other household members present at the time of the interview. Home interviews also

provided the opportunity for additional clues to neighborhood and residential character and the nature of the terrain between respondent homes and the nearest BART station. Further, the home setting provided a basis for discussing the reasons for the selection of respondent's residence location.

Other interviews were conducted at the workplace when a respondent expressed a desire to conduct the interview during the working day. Generally, we experienced greater ease in gaining access to the workspace and time of middle and upper income respondents than gaining entry to their homes. The interviews lasted from fifty minutes to two and a half hours. The greater part of the questions related to activities within the work, shopping and recreational and leisure spheres and the impact of BART and other transit modes on the conduct of these routine life activities.

Second Stage Family Panel Interviews

Selection of Respondents

The second stage family panel interviews were conducted by telephone with all Phase I respondents who could be recontacted and where Phase I interview responses revealed the likelihood of BART impacts on household life routines. The panel included 35 members from the first stage. Although some Phase I respondents could not be recontacted, only one actually refused to participate in the second phase interview process.

Interview Format

A decision was made on the basis of Phase I responses, project resources, and emerging research needs to employ a different interview technique in the Phase II interviews. The Phase I instrument had been designed as an exploratory field interview tool designed to ferret out any indications of BART impact along a wide range of possible subjects of inquiry. BART, in its early period of interim service, had only limited and variable impacts upon the life routines of Panel members. A focused interview approach was deemed the most effective complement to the more open-ended Phase I work. For this purpose, a series of short interview schedules were designed based upon questions and probes for main subject areas of concern along the nine life style dimensions of interest. An approach combining standardized introductory questions with personalized probes based upon first stage responses was developed and field tested. The field pre-tests revealed no substantive difficulties with this approach. Telephone administration of the Phase II instrument permitted a wider range of second stage interviews. Our approach corroborates the experience of M. Johnson in the BITS-2 Interviews (1975) that the telephone approach did not appear to be a detriment to focused interview questions. Particularly on the heels of the extensive and longer Phase I interviews, the second stage interviews were received very positively because of their more focused character and shorter duration (from five to thirty minutes). Second stage interviewers had also participated in the Phase I Panel work.

Phase II work focused on determining the extent of BART use and BART related impacts, changes in use or impact since Phase I, and present meanings of BART, and BART as a transit mode for respondents and their families within each of the relevant life style dimensions.

Parental Contact Interviews

Interviews were also conducted with parents of youthful BART users originally contacted in our field youth contact interviews of Spring and Summer, 1976. The parental interviews were primarily focused upon the meaning of youthful BART use for parents and other family members. These short (15-25 minute) interviews were conducted by phone by the youth contact interview researcher. The interviews provided additional input on the meaning of BART for the organization of family routines and the relative independence or dependence of family members.

Interviews at Recreational-Cultural Destinations or at Stations Near to Recreational Destinations

Selection of Respondents

Respondents were interviewed at points of contact in a non-systematic intercept fashion. Most interviews were conducted on special BART recreational promotion days in connection with events at the Oakland Coliseum (primarily the Circus) and during Labor Day, when a reduced fare (25¢) was in effect and frisbee contests were being held at four BART stations.

Interview Format

A short contact interview format was used to gain insight into the recreational uses of the system. Information was also obtained on respondents' other BART use, BART's possible role as a stimulator of new trips, the meaning of using BART for a trip ordinarily taken by another mode, limited demographic information, and respondents' attitudes toward BART for recreational and other trip purposes. Recontact information was also obtained but not employed during the research time frame.

Supplementary Data Base

Other BIP data and supporting data from BART and BART market research contractors have been used to supplement assessment of BART impacts on the life routines of Bay Area BART users. In addition, certain background demographic data and data on non-BART users have provided a regional perspective on the meaning and extensiveness of observed BART life style impacts.

The supplementary data base for BART users includes research findings from the following studies:

- oo The 1975 and 1976 BART Passenger Profile Surveys. A summary of travel behavior and demographic characteristics of BART riders obtained through self-administered and partially self-administered questionnaires distributed to a sample of BART riders.
- oo BITS-2. A random sample of adults in four selected areas of the region were administered a detailed questionnaire on travel behavior, demographic, and attitudinal dimensions. This project included a second survey of earlier travel survey respondents.
- oo BART Market Segments Project, Reports on Task B, C, and Appendix - Prepared by Market Facts, Inc., Chicago, Illinois, 1975-76. This report includes a summary of transit mode choices for different market segments in the Bay Area. Sample panels from 36 market segments of interest were sent self-administered mail questionnaires on mode choice for work, recreational and shopping trips. The analysis includes an inventory of demographic and attitudinal variables that are correlated with BART use and non-use.
- oo BIP Environment Project Residents' Response Survey. This survey of community responses to BART in residential neighborhoods provides data input on BART impacts on perceptions of residential desirability.
- oo BART surveys of community responses to the Circus, Labor Day, and Liberty House promotions. These field surveys of responses to BART promotions provide insight into the actual and potential non-routine travel market, and suggest impacts of BART on shopping and recreational routines.

Background Data - Regional Demographic Characteristics and Travel Behavior of Regional Transit Consumers.

- oo 1970 Census
- oo TS&TB Spring Telephone Survey - a random digit dialing regional sample of 1,000 persons. Provides data base on relationship between basic demographics and transit mode choices.

- oo Bart Bay Area Public Response Survey (1976) - a random sample of 900 persons within the three BART counties, including BART users and non-users.

- o Research Strategy, Approach and Procedures: BART's Impacts on Youth

- Geographic Focus

- Research activities on youthful life styles concentrated in areas around BART lines. Interviews have been conducted on trains, in station areas, in the street and park areas close to stations, and with proprietors and managers of stores and youth-type hangouts close to BART stations. The logic here is that BART is a regional network with relatively uneven feeder service. Most youth have no car access to and from BART. Therefore, youthful users and youthful impacts, where they exist, will likely be focused in the area close to the BART line.

- Population Focus - BART Users

- Since a very limited portion of the Bay Area population even within areas close to BART are regular or frequent users of BART, we decided to focus our research on BART impacts upon youthful BART users. We may assume that with extended hours of BART service and improvements in BART headways and feeders, this population of users is likely to increase. The impacts we observed among users under interim service conditions are suggestive of the areas of likely impact under extended service and full service operation. The decision to focus on users was made because of limitations in resources and the desire to make contact with the broadest range of potential BART impacts upon youth in the present period of service.

- Methodological Approach to Investigation of BART Impacts on Youth

- Our primary field research activities were conducted by high school age and youthful interviewers under the training and supervision of senior social scientists. It was assumed that youthful persons would have the greatest access into young people's routine lives. This approach was eventually confirmed by the effectiveness and rapport that seemed to be established between the researchers and respondents as the study progressed. The research techniques were:

- oo Preliminary Observations. Preliminary observation and informal interviews on BART trains and in station areas were combined with interviews of youthful informants to get some insights into the likely areas of potential BART impacts. This information was employed, along with educated guesses based upon available research findings on youth and

their activities and the experience of project staff in studying adolescents over the last ten years, to develop research questions for contact interview instruments.

- oo Spring Field Contact Interviews.
A short questionnaire was completed and employed for in field interviews with youth in BART stations on trains and in the areas just around the stations. This research instrument gathered information on present BART use, opinions of BART, other BART use, use of BART for family related activities, and parental attitudes toward youthful BART use. A key feature of this interview approach was the obtaining of basic demographic data on youthful users in addition to necessary information and permission for future recontacts. It was assumed that recontacts would be held with interesting cases of youthful BART users and with the parents of these users. The approach assumed the importance of determining both youthful experience with BART use and the meaning of youthful use for other family members as interpreted by parents of BART users.
- oo Spring/Summer Interview with Staff and Informants at Youth Oriented Businesses and Recreational Locations and Facilities.
Interviews were held with over 200 informants at over 200 businesses and residential locations proximate to BART. This work was largely exploratory. The focus of the research was to seek evidence of BART impacts upon youth patronage and hanging-out at businesses and recreational areas close to BART.
- oo Summer Field Contact Interviews with Youthful BART Users.
Contact interviews were conducted with approximately 100 youthful BART users on trains, in stations, and in the station areas. These interviews generally followed the format of the earlier spring interviews. The goal of this data collection was the assessment of variations in the patterns of youthful BART use during the summer vacation time span. Earlier interviews confirmed that a large segment of youth employed BART during the school year for school related trips. Of interest here was the variation that might occur in youthful travel during the summer period. Observations had suggested an increase in youthful travel during the summer period, including youthful joyriding and hanging out in some station areas.
- oo Fall 1976 Youth Recontact Interviews.
In order to assess changing patterns of BART use among youthful BART riders and to determine changes in BART

impact over time, we recontacted 50 respondents from the spring and summer field contact interview panels. These new interviews were conducted to determine present BART use, changes since the last interview, family perceptions of BART impact, parental attitudes toward BART use, and BART related impacts among youthful peers. The interviews also elicited permission to contact respondents' parents for short interviews.

oo Parental Contact Interviews.

These interviews assessed parental views on their childrens' BART use, including attitudes toward BART's impact on the independence/dependence of youth, family and extended family visiting, access to places youth shouldn't go or their getting into trouble, typical travel patterns of parents, BART's effects on freeing parents from chauffeuring their youth, and parental attitudes toward the safety/desirability of BART relative to the bus.

oo Observational Census.

An observational census was conducted at six East Bay stations to assess the age breakdown of non-peak BART riders. It was our feeling that the PPS, which includes some 14-18 year old youth, does not present a complete picture of the youthful ridership on the BART system. Further estimates of the level of youthful patronage were necessary to determine the extent of BART's impact as a system upon youth proximate to BART lines.

o Evaluating the Methodology

Our research activities confirm that an open-ended, intensive case study approach was an effective methodology for study of life style impacts. This technique provided real entry into the experiences, sentiments, and opinions of transit consumers. It provides a user oriented guide for development of transit services to meet the order of people's routine lives. The failure to examine the social meanings of transit development leaves us without a true understanding of consumer needs and the potential market demand for a variety of possible transit alternatives. The intensive case study research technique did provide entry into consumers' experiences of BART. It suggests that rail rapid transit is experienced as more desirable, attractive, modern, and comfortable than bus travel. This perspective is expressed by both regular car users and public transit users.

The methodology also led to insights into concerns of patrons for improvements in BART service. Concern about late night and weekend service

and improved feeder connections seemed strongest among transit-dependent persons. All riders, but particularly work commuters, expressed concerns for improved system reliability. These findings are essentially consistent with the reports on consumers' attitudes based upon regional transportation survey data from different locales throughout the nation, with one very important exception (Wachs, 1976).

BART's non-access characteristics appear to be a significant and vital feature of its attractiveness to both regular car and bus users. This differs from reports that comfort and other non-access characteristics are relatively unimportant in comparison to time, cost, and reliability. In other areas, the case study approach provides fuller insights into the worlds of transit consumers, but it does not appear to produce findings which differ from those based upon large scale surveys of user populations. It does, however, reveal that travel behavior and individual consumer experiences are rooted in a matrix of worldly activities and concerns. As such, the use and experience of transit appears to have meanings, and be influenced by social meanings which are not ordinarily revealed through conventional survey techniques.

Under conditions of full (weekend and late night) service, there will be a need for a regional random sample of transit consumers. This sample will be useful to further specify the transportation development options which arise from the present work. Prior to full service, the BART user population is too small and too limited in its life style purposes to justify the type of extensive survey sample that might be very beneficial under full service operation.

APPENDIX A

o The Issue of BART's Reliability

Our interviews with regular BART users suggest that as a group they assume that BART is not a consistently reliable transit system. Most regular users come to expect significant variation in the wait and travel times for their regular BART trips. Planners and transit agencies in other areas are interested in the actual level of BART's operating service characteristics and the extent to which the system performs on a reliable basis.

Martin Wachs, in his survey of consumer attitudes toward transit (Wachs, 1977), makes clear that reliability is a very important feature for all market segments undergoing mode choice decisions. Interview respondents confirm the importance of reliability factors in their travel choice decisions. However, at present we have no reliable measures of BART's actual present or historical performance in terms of the two key measures of mean trip travel and wait times, and the standard deviation of travel and wait times. Observation and present statistical measures suggest that BART is improving in terms of its level of service reliability. Some improvement may be attributed to the engineering modifications that have been made in the braking system, the door opening and closing mechanism, the motor housing, and the speed of operation of the trains. At present, while we lack statistics on travel and wait times, a number of surrogate indicators on the level of operations performance do exist. These measures include:

1) Unscheduled Train Removals Per 1,000 Revenue Car Hours.

Figures are available on the total number of trains removed from BART revenue service during 1976 and the first three months of 1977. These figures, which are presented graphically in Figure #6, suggest that there has been a clear improvement in the number of serious operations failures which influence train service performance.

2) Weekly Car Failure Rates: Cars Failed in Revenue Service Per 1,000 Revenue Car Hours.

This statistic provides a further indication of the trend in BART's operational reliability. Service reliability appears from this indicator to be improving. However, this indicator, as presented graphically in Figure #7, provides us with no clear indication of the actual service implications of weekly car failures for mean travel and wait times.

3) Weekly A-Car and B-Car Availability: Average Weekly Car Availability, Percent of Maintenance Fleet.

Particularly in the early period of BART service, mechanical and operational problems with train operating and control equipment resulted in a serious constraint in the number of cars available for revenue service. Service performance characteristics, headways and service hours were limited by a lack of A and B cars relative to the number required to achieve the present headways of scheduled 12-minute intervals on the system as a whole and scheduled 6-minute intervals in the downtown Oakland and San Francisco line segments. Car availability, as indicated in Figures #8 and #9, has improved. This improvement has primarily been reflected in extra Concord Line trains in the commute direction during the afternoon peak, an increase to 10-car trains in the peak, and in the extension of interim service on evenings from 8:00 p.m. to about 12:00 p.m. Again, car availability does not provide a clear indication of service levels, but rather suggests the constraints on service potential.

4) Passenger Offloads.

While all of the above indicators suggest a clear improvement in the potential and actual quality of service relative to unplanned service interruptions and delays, another indicator, daily passenger offloads, as presented graphically in Figure #10, suggests that the system is still plagued with unplanned delays due to train equipment failures. Daily passenger offload measures for the last year suggest no clear trend, in terms of upward improvement, in the need to offload travellers in the midst of the BART trips. Passenger offloads appear to be one service phenomenon which is particularly disturbing to travellers in transit. The continued requirement for passenger offloads during revenue service is one facet which likely contributes to user perceptions about the unreliability of BART as rapid transit.

5) Headways Summary Report: Percentage of Headways at Five Stations Exceeding the Target by 50 Percent.

The Headways Summary Report (Figure #11) probably provides the best indication of the level of reliability of present BART service. The figure suggests that present BART service as measured at five stations along the BART lines is subject to greater than a 50% delay in train arrivals only approximately 10% of the time. This means that under regular service conditions during the three months under study,

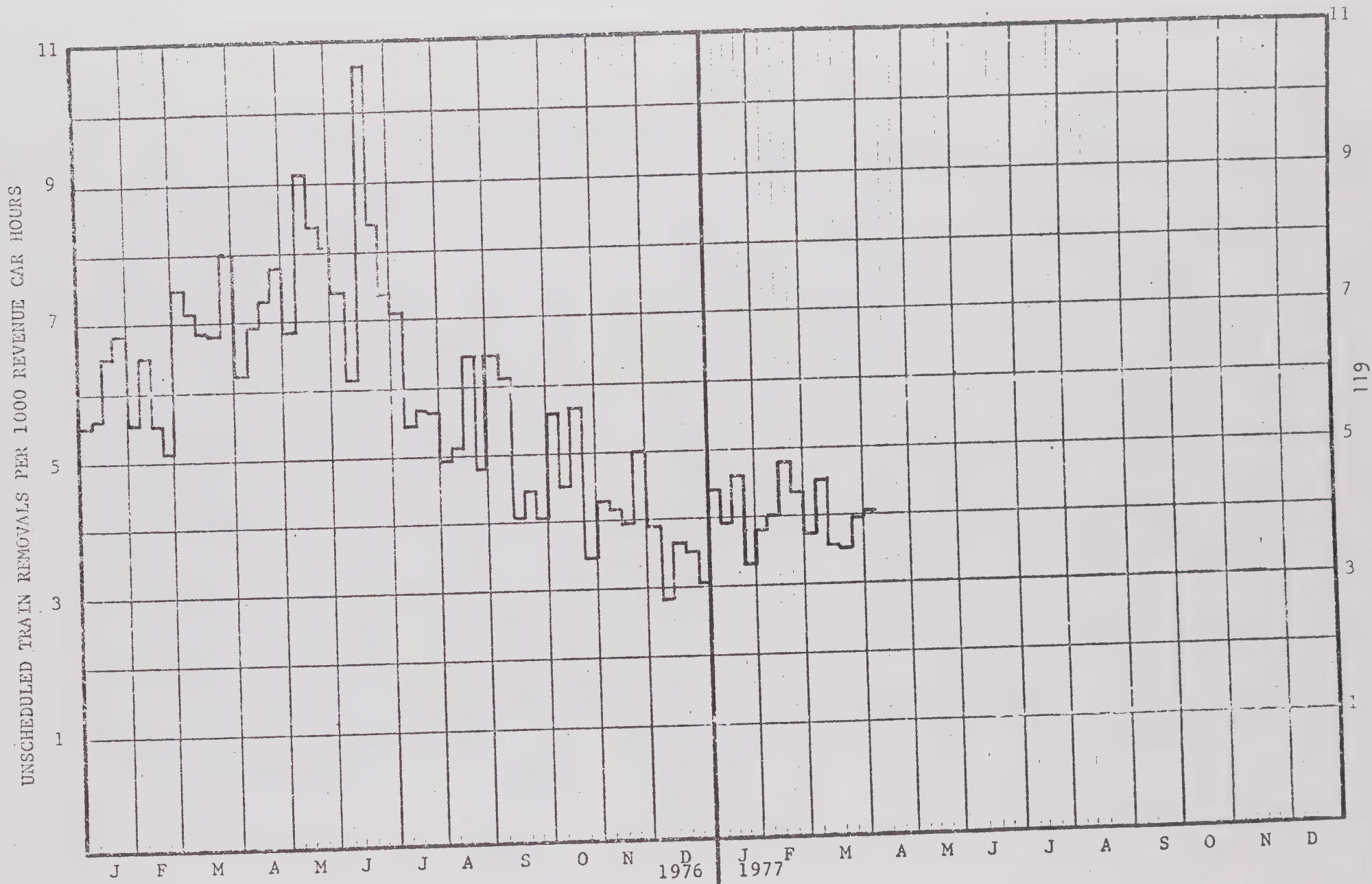
BART exceeded the twelve minute headways at Hayward, Walnut Creek, and Berkeley stations by over 6 minutes only 10% of the time. Or, at the Montgomery Street station, total headways exceeded 9 minutes only approximately 10% of the time. However, these headway measures, while providing the best indication of service reliability, offer no insight into the travel times for these same service periods. During wet and rainy weather, and under conditions of certain types of equipment failures, BART operates under an impeded travel mode. Under these circumstances, trip times rather than headway measures would provide better estimates of the system service characteristics.

New Reliability Measures Under Preparation

BART is presently at work on a comprehensive headway and travel time recording system. There have been technical and conceptual obstacles to the development of such a system. However, the measures of headway and travel times necessary for adequate estimates of BART's objective service reliability should be available before the end of 1977.

Implications of Improved Reliability for BART Patronage

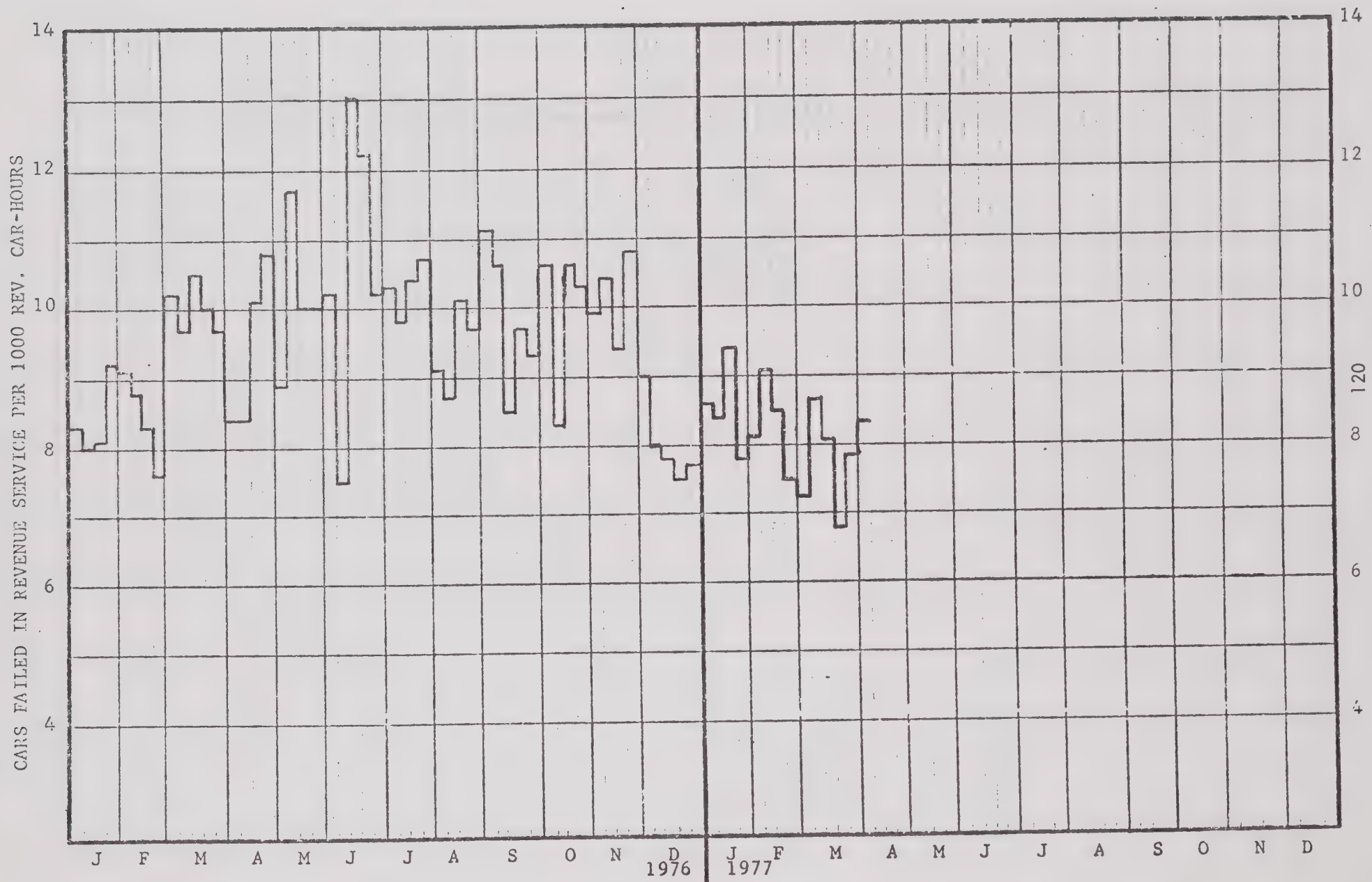
If BART reliability could be achieved within reasonable confidence limits, we might expect an increase in the taking of shorter trips via BART. Also, some enhancement of BART's market share for work commute trips will probably occur when BART is perceived as a relatively consistent and reliable form of travel.



III. WEEKLY UNSCHEDULED TRAIN REMOVAL RATE

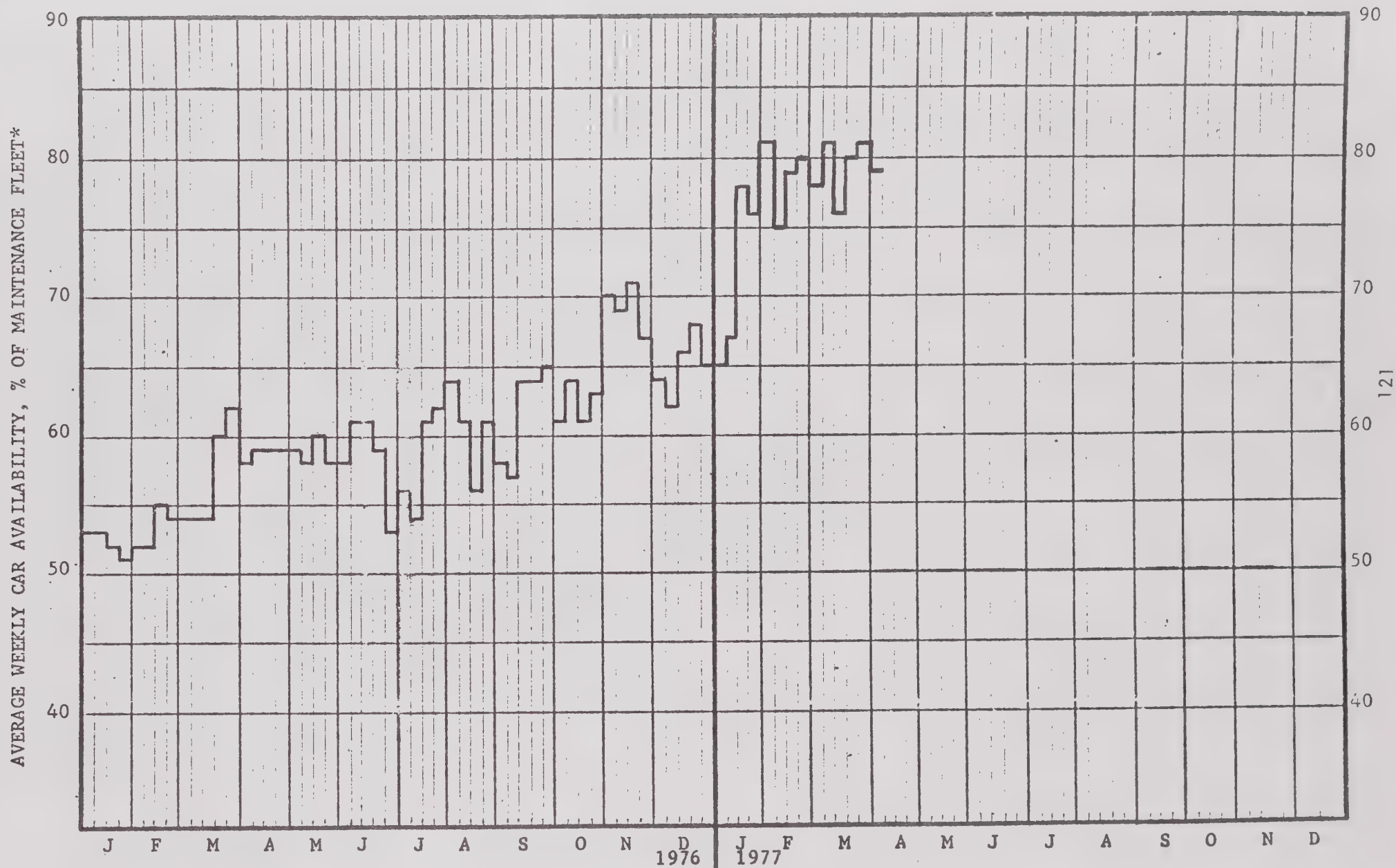
Source: Central Trouble Desk Vehicle Reliability Rpt.
MPS Weekly Hr. & Mi. List, M97001

FIGURE 7



IV. WEEKLY CAR FAILURE RATES -- IN REVENUE SERVICE

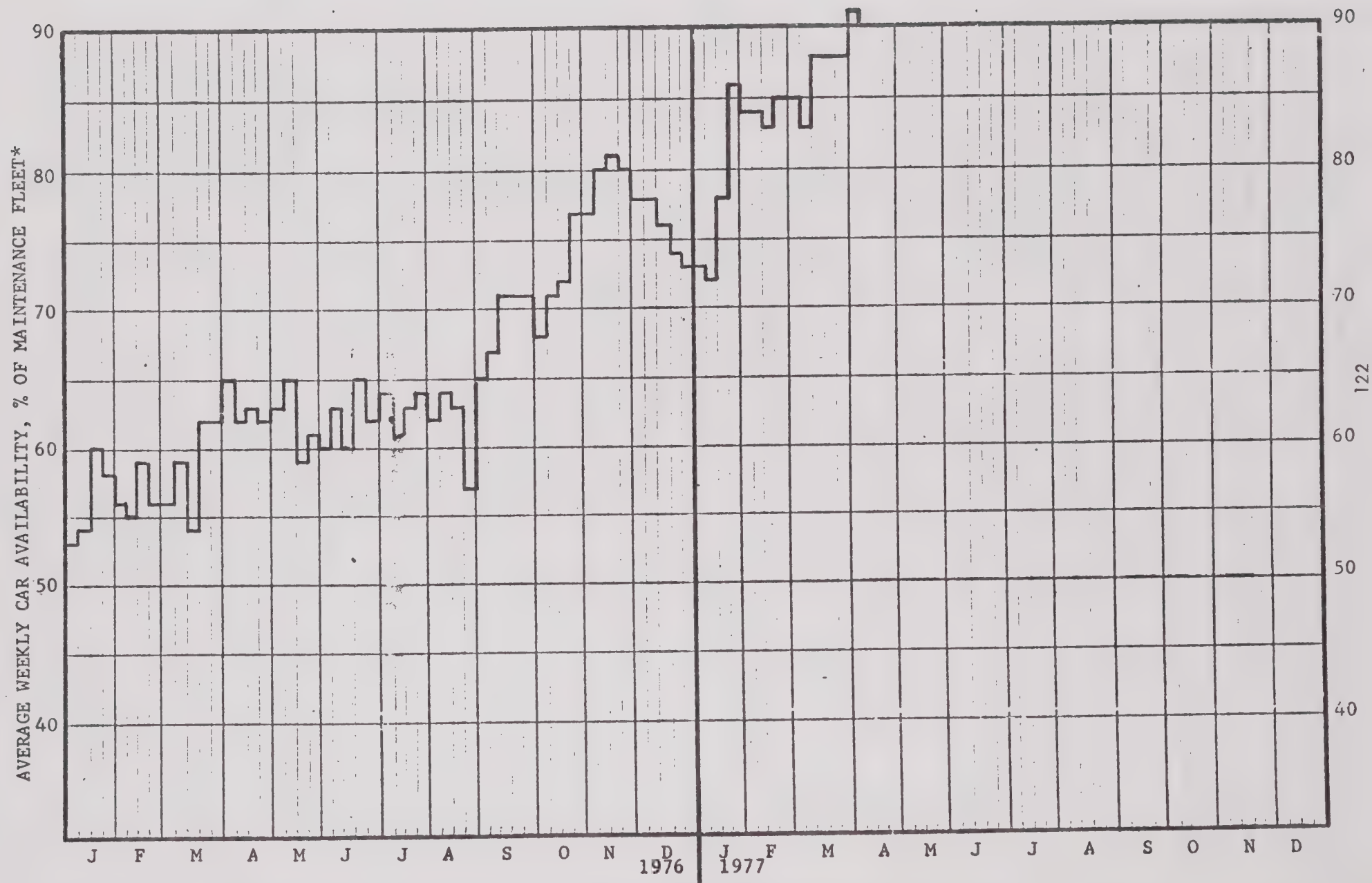
Source: Central Trouble Desk Vehicle Reliability Rpt.
MPS Weekly Hr. & Mi. List, M97001



I. WEEKLY A-CAR AVAILABILITY

Source; Daily Vehicle Status Rpt.
 *Maintenance Fleet = All Cars less
 Long Term Out-of-Service Cars

FIGURE 9



II. WEEKLY B-CAR AVAILABILITY

Source: Daily Vehicle Status Rpt.

* Maintenance Fleet = All Cars less
Long Term Out-of-Service Cars

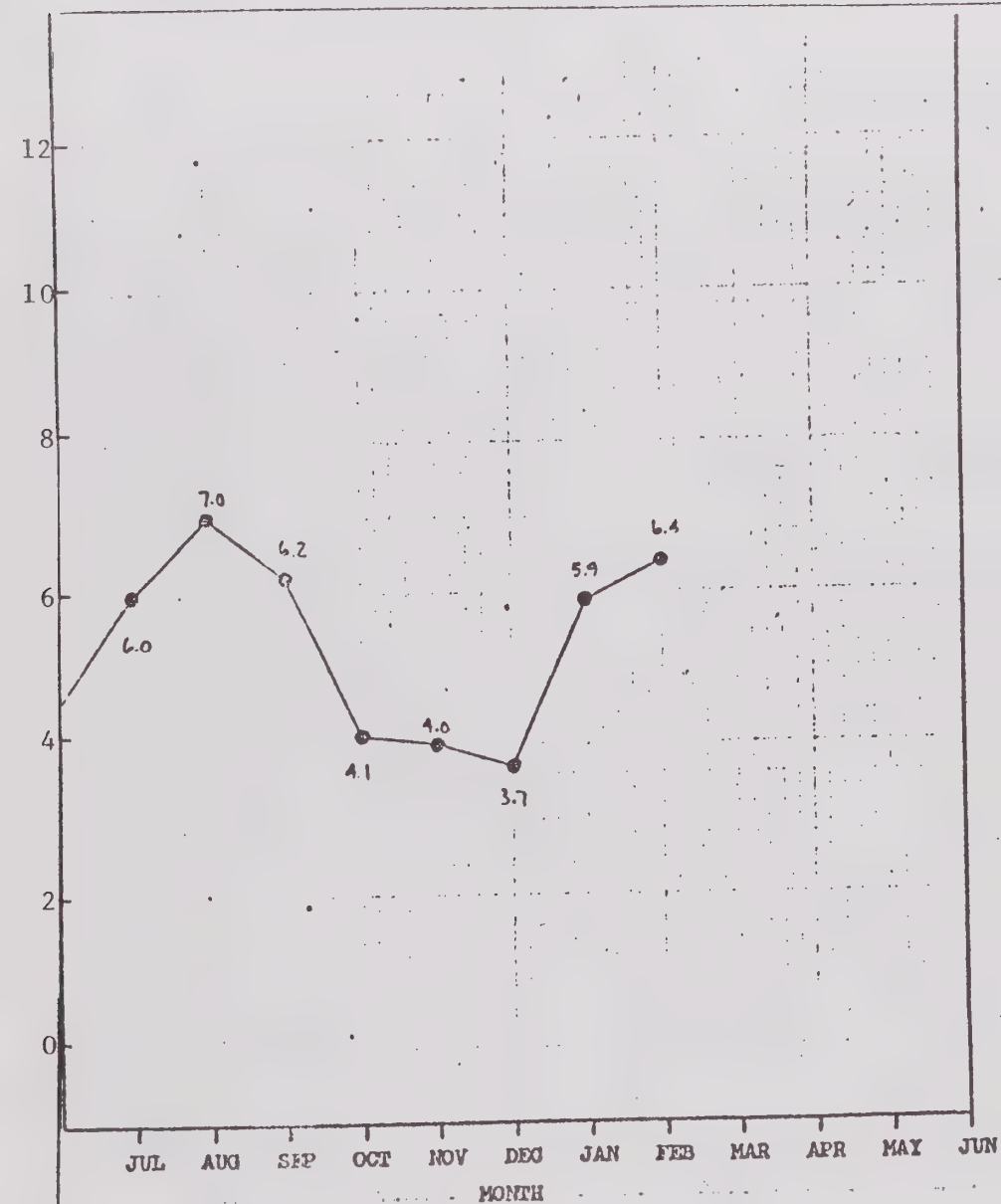
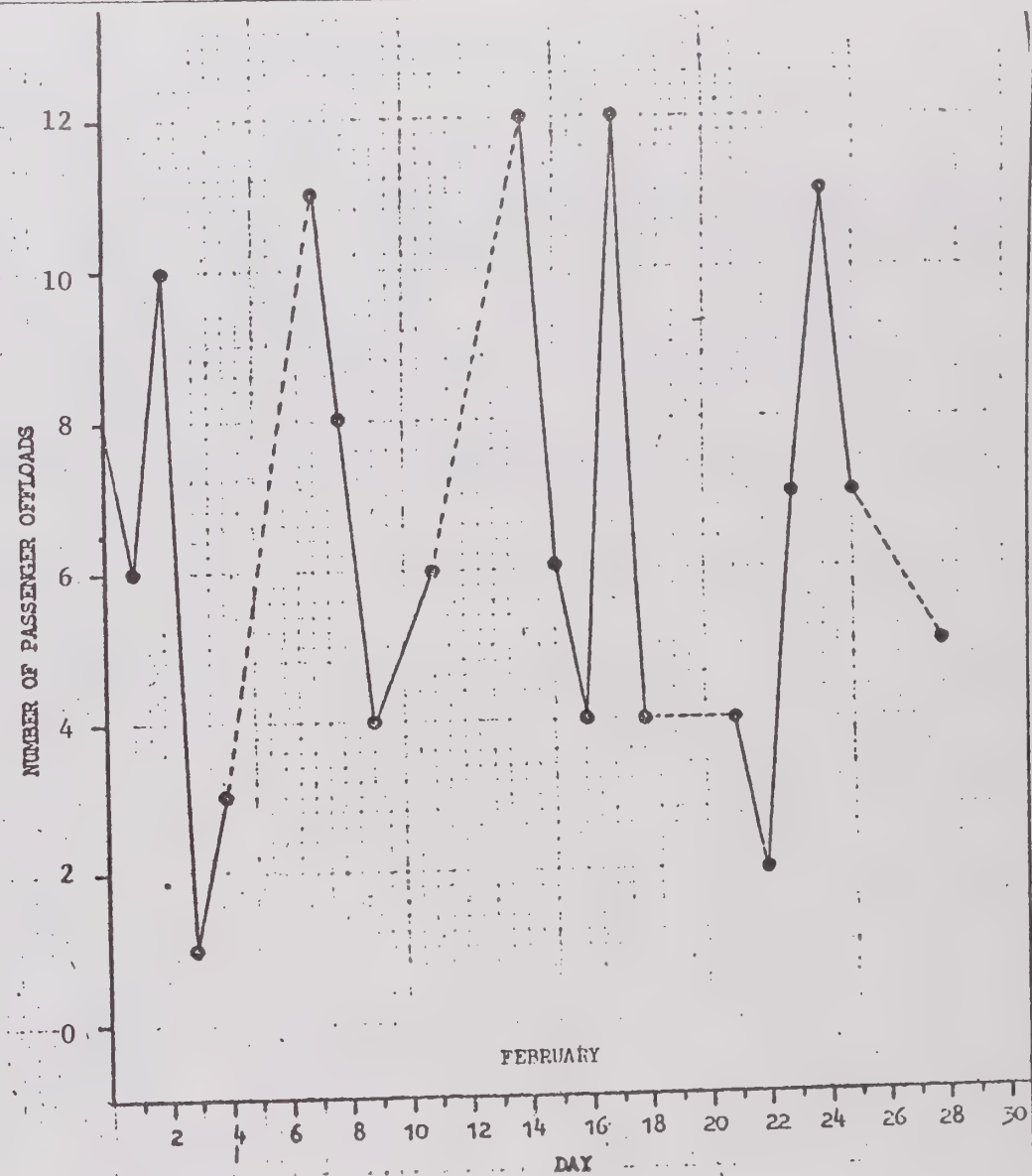


FIG. III-A DAILY PASSENGER OFFLOADS
SOURCE: DAILY OPERATIONS SUMMARY
TECHNICAL SERVICES



3-10-77

FIGURE 11

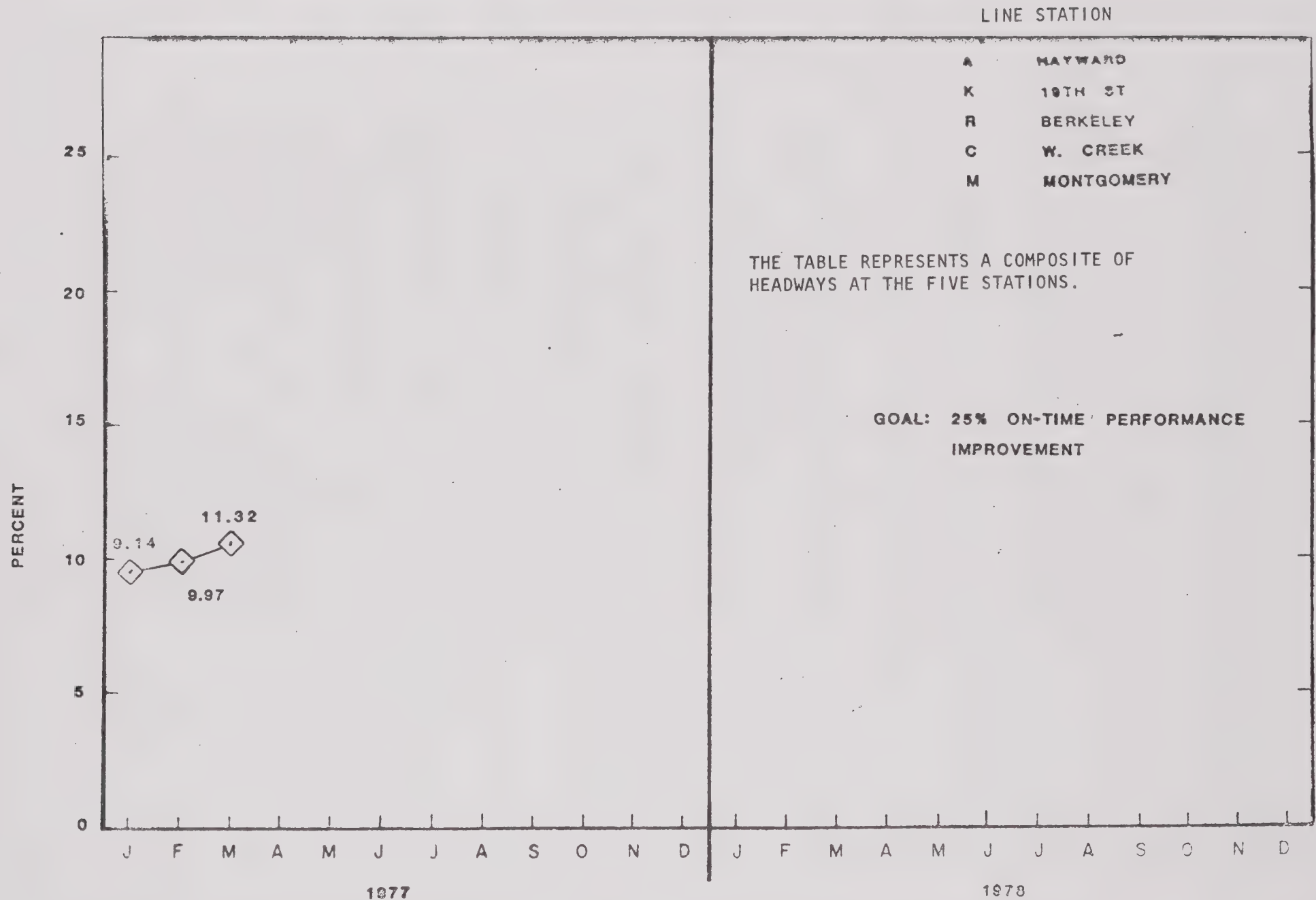


FIGURE I-A PERCENTAGE OF HEADWAYS AT FIVE KEY STATIONS EXCEEDING TARGET BY 50%
SOURCE HEADWAYS SUMMARY REPORT

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